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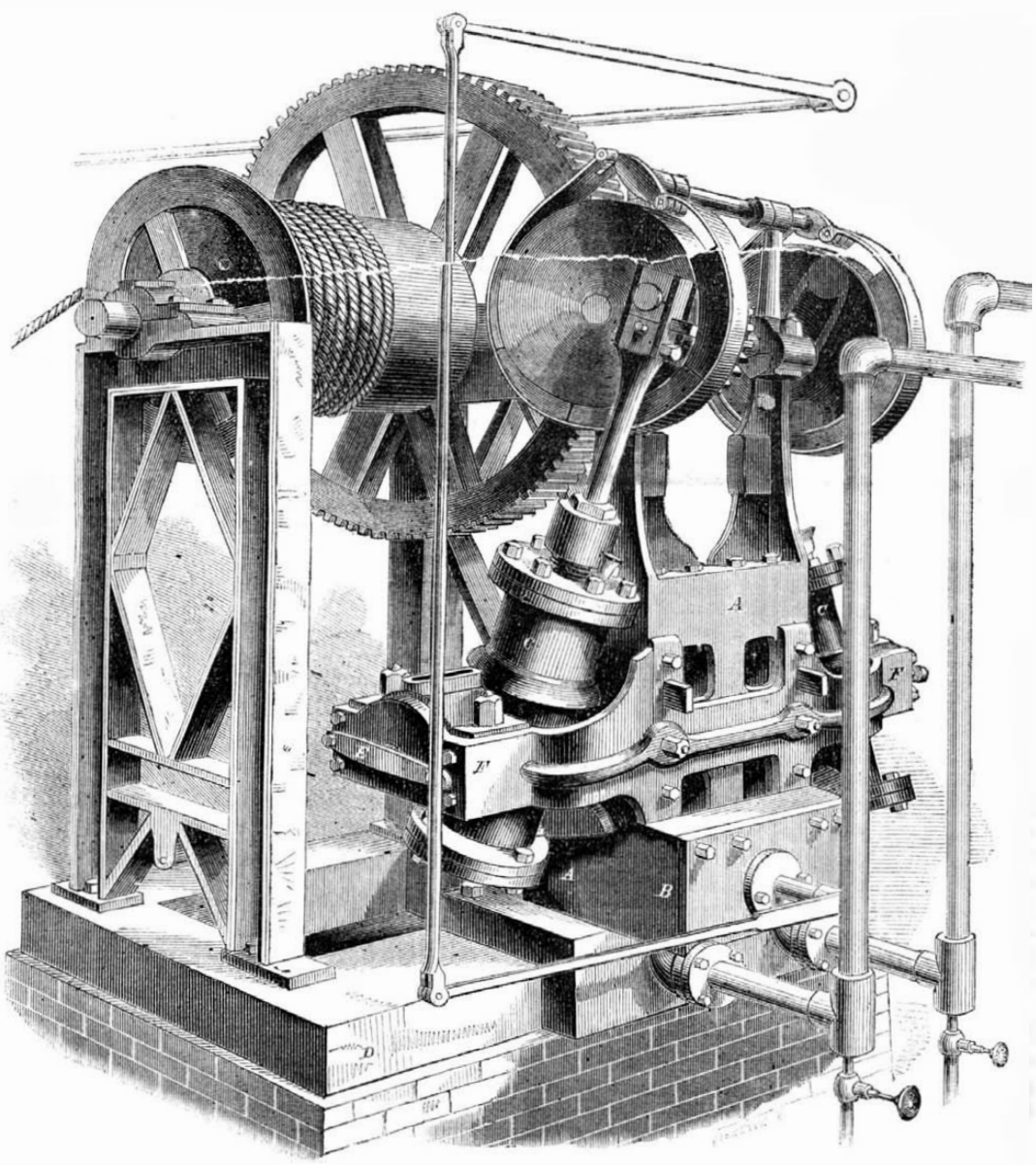
IMPROVED OSCILLATING ENGINE.

The expansion and contraction of metal from changes of temperature has been the cause of more inconvenience and difficulty in the working of the steam engine than perhaps any other property of matter. Many acute and fertile minds have devoted a great deal of time and study to plans for counteracting the effects of these changes, and the field still proves an inviting one for men of inventive genius. In the invention which we here illustrate, the evils of expansion are effectually avoided, and at the same time a very convenient reversing arrangement is secured. It relates to the double oscillating engine, and the engravings represent two forms of engines, one being shown in the large perspective and the other in the sectional cuts inserted on the next page. We will first describe the latter and then explain the modifications shown in the perspective view.



OTIS' IMPROVED DOUBLE OSCILLATING ENGINE.

Fig. 1 is a central vertical section at right angles to the shaft of a double oscillating engine. Fig. 2 is a vertical section of the same taken parallel with the shaft. Fig. 3 is a vertical section of the reversing valve and valve chest. Fig. 4 is a horizontal section of one of the cylinders. Similar letters of reference indicate corresponding parts in the several figures.

A is the bed-plate of the engine. B is a steam chest in the form of a quadrangular box of cast iron, with a system of passages (to be presently described) formed by coring. This steam chest may be considered as the principal portion of the framing of the engine, as it supports the two standards, C C, in which are the bearings of the main shaft, and also supports the bearings, *a a*, for one trunnion, *i*, of each of the two cylinders, E E. The other two trunnions, *j j*, are supported on bearings in two standards, F F, erected on the bed-plate, one on each side of the steam chest. H is a valve chest, and bolted to t e front of the steam chest, B, and containing the reversing valve, This valve chest is divided into two compartments, d *c*, to the latter of which is connected the steam pipe, and to the former of which is connected the exhaust pipe. The compartment, *c*, contains the valve, which is of the oscillating disk kind, and which fits to a flat seat provided for it on the steam chest, B. This seat contains three ports, *d e f*, of which *d* and *e* communicate with separate sets of passages in the steam chest, B (as will be presently described), and *f* communicates by a passage, *k*, in the steam chest, B, with the exhaust compartment, *b*. The valve has in its face a cavity, which will bring either the port, *d* or *e*, into communcation with the port, *f*, and has two openings, *g h*, right through it, so arranged that when the cavity covers the ports, *d* and *f*, the port, *h*, will be opposite to *e*, and when the said cavity covers the ports, *e* and *f*, the port, *g*, will be opposite to *d*, as shown in Fig. 3. The central stem of the valve, G, works through a stuffing-box, *r*, in the valve chest, H, outside of which it is to be furnished with a lever for the purpose of bringing it to either of the positions above specified, or to a position to close both ports, *d* and *e*, for the purpose of stopping the engine. Near the valve there is a passage, *m*, leading from the induction compartment of the valve box through part of the steam chest, B, to a chamber formed in the bed-plate, said chamber being in communication with the cavities of the standards, F F, and the said chamber and cavities being kept filled with steam from the induction compartment, *c*, of the valve box.

The cylinders are furnished each, on the side next the steam chest, B, with two flat faces, *s s*, one near each end; said faces constituting valves, and each of them containing a port for the induction and a port for the eduction of steam, through two ports on corresponding faces provided on the valve chest for the said faces of the cylinder to work against; the said ports in the cylinder and steam chest being opened and closed to each other in turn by the oscillation of the cylinder in a manner which is common to many well-known oscillating engines, and therefore requires no description. The port, *d*, in the valve seat, communicates with an upright passage, *d**, in the steam chest; and from this passage, passages, *d*1 *d*1 *d*2 *d*2, branch off to the ports in the side faces of the steam chest, one passage leading to the upper and another to the lower of each cylinder. The port, *e*, in the valve seat communicates with a similar upright passage, *e**, in the steam chest, and from this passage similar passages, *e*1 *e*1 *e*2 *e*2, branch off to the ports in the side faces of the steam chest, one passage leading to the upper and the other to the lower end of the cylinder. By bringing the valve, G, to one or other of the positions hereinbefore mentioned; that is to say, to open either of the ports, *d e*, to the steam compartment and the other to the exhaust compartment of the valve chest, either set of passages, *d* d*1 *d*1 *d*2 *d*2 or *e* e*1 *e*1 *e*2 *e*2, may be made to constitute induction passages and the other set to constitute eduction passages, according to the direction in which the rotation of the crankshaft is desired; and by shifting the valve from one to the other of such positions the engine may be reversed.

L L are springs secured to the standards, F, for the purpose of pressing against the ends of the trunnions, *j j*, and thereby holding the cylinders close up to the steam chest and preserving steam-tight joints between them. These springs have screws and nuts, *t t*, applied to them for the purpose of graduating their pressure.

By providing the chamber, *n*, in the bed-plate, connecting the induction chamber of the valve chest with cavities in the standards, F F, not only is the bed-plate caused to expand and contract as the cylinder becomes heated and cooled, thereby keeping the joints between the cylinder and steam chest tight, but the standards, F F, are caused to expand and contract vertically in a manner corresponding with the vertical expansion and contraction of the steam chest, and by that means the

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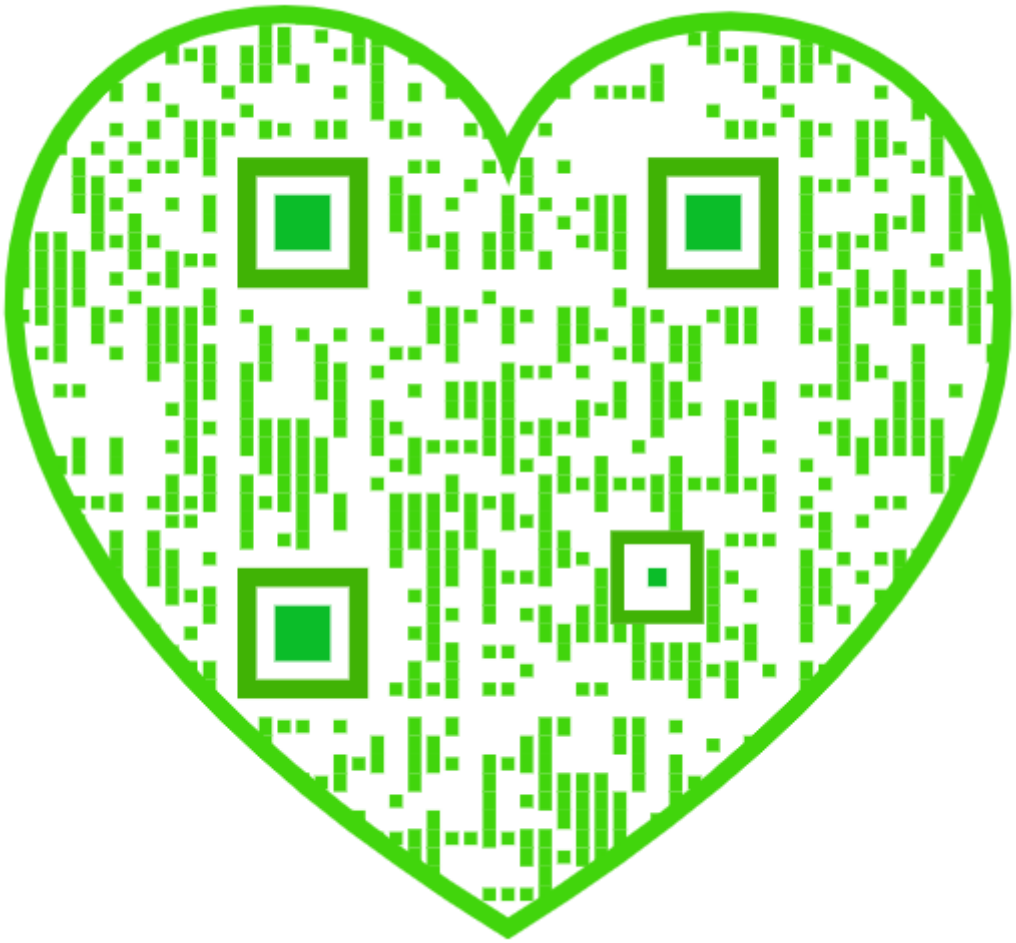
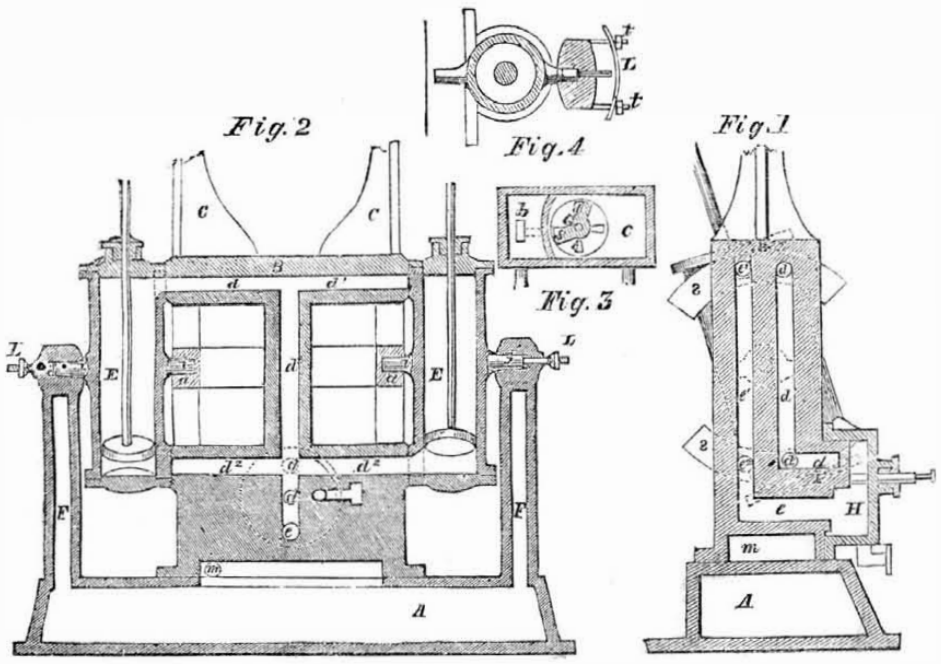


bearings of the outer trunnions will rise and descend with the bearings of the inner ones, and the axis of oscillation of the cylinders will remain always parallel with the axis of the main shaft.

The modification shown in the perspective will be readily understood by a glance at the engraving. The outer trunnions of the cylinders, C C, instead of being supported by hollow [illegible] communicating with the bed-plate, D, have their bearings in a long bar or yoke, F, which is bolted to the steam chest, A, so as to rise and fall with the expansions and contractions of the latter.



We have seen the engine from which these engravings were taken; it is in operation at the new and elegant jewelry store of Messrs. Ball, Black & Co., on Broadway, where it is used principally for hoisting goods. It runs very smoothly, not leaking a particle between the face of the cylinder and that of the bed-plate. It it the invention of Messrs. E. G. and C. R. Otis, to the former of whom—residing at Yonkers, N. Y.—inquiries for further information in relation to the matter may be addressed.

GIFFARD'S INJECTOR.

This is the name of a peculiar feeder for steam boilers, the invention of M. Giffard, of Paris. In its elements and action, it consists of a jet of steam flowing through a tube taken from the steam-chamber of the boiler; thence it passes through a narrow nozzle, at the point of which it comes in contact with a jet of water in an angular pipe running from the well or tank; this water is carried by the steam into a throat, where it opens a check-valve and enters the boiler under the water-line. In this case, steam of a certain pressure—say 10, 20, 30 or 60 lbs.—forces water into a boiler where there is an equal amount of pressure on every square inch. This really appears paradoxical; but, nevertheless, it is a fact. This injector has been employed for one year in France, is coming into extensive use in England, and we had the pleasure of witnessing one in operation last week at the works of Wm. Sellers & Co., Philadelphia, the agents for the invention in the United States. The apparatus is the most simple, compact and peculiar for the purpose imaginable. A small tube comes down from the steam-chamber in the boiler and enters a little brass box, resembling an enlarged nut with a hole in its side. Here a hissing sound is heard; and, looking through the little opening, a snowy jet of combined steam and water is seen rushing through the feed tube, without the motion of a single pinion, piston or lever. Had any person proposed such an arrangement and method of feeding steam boilers, to most all the scientific men in the world, we believe it would have been condemned as an impossible project. The answer to such a proposition would have been: "As the pressure in all parts of the boiler is equal, steam taken from one part cannot force water into another part against an equal pressure—the two pressures will exactly balance each other." How much superior, if any, the injector may prove to be to a good force pump, we do not know. It cannot feed such warm water as a pump, but its compactness and simplicity may give it the preference. It appears to be more safe than a pump, because there are three ways of detecting whether it is working properly or not; and, as the safety of a steam boiler is dependent upon the correct action of the feed, the injector has much to commend it. Thus: when it is in operation, the ear can hear and the eye can see what is going on in the inside, and the hand can also feel whether or not the steam and water are flowing. In darkness and daylight, it signals its own operation to the engineer.

The feed-water is under the most perfect regulation, so as to allow the exact quantity to pass, according to the demands of the engine. The size of these injectors, as well as the temperature of the feed-water, varies with the pressure of steam carried.

The following is the theory of the action of the injector, as given by Mr. John Robinson, of Manchester, of the firm of Robinson & Stewart, the agents of the apparatus in England:—"The pressure on all parts of the interior of steam boilers being equal, some reason must be sought why steam taken from one part is able to overcome the resistance opposed to its entrance in another part of the same boiler. If a pipe conveying steam were turned directly back into the water of the same boiler, it is evident that equilibrium would ensue, and no effect be produced. If, on the other hand, a break were made in the continuity of the pipe, so as to leave an interval open to the atmosphere, the steam would rush from one pipe and water from the other in the boiler, with a velocity proportioned to their *different densities*. In constructing the injector, the feed-water chamber is placed at the break in the pipe; and this arrangement accounts for the power of the steam to overcome the resistance to its entrance into the receiving pipe of the boiler. The jet of steam being concentrated on the water, forces its way through the interval surrounded by feed-water, by contact with which it is gradually condensed, and reduced in volume and velocity, until it it entirely converted into water at the throat. In doing so, it imparts to the feed-water a velocity proportioned to the pressure in the boiler and its own temperature; and, being non-elastic, the feed-water acquires sufficient momentum to overcome the resistance of the water in the boiler." Mr. Robinson further says, in an article on the subject in the London *Artizan*:—"The injector is a valuable application of a force which has never been explained in books. With it, by steam of 24 lbs. pressure, it has been found possible to inject water into a boiler at 48 lbs. pressure."

THE SMELTING OF LAKE SUPERIOR COPPER.

The Haughton (Portage Lake) *Mining Gazette* gives the following description of the practical operations in the smelting of American copper:—

For the purpose of obtaining pure malleable copper from the masses, stamp and barrel-work, sent down from the mines of Lake Superior, it is only necessary to separate the earthy matter which still adheres to the metal, and then to deprive the copper of the oxygen it has absorbed while in the liquid state. The furnaces are reverberatories of an ordinary construction.

Sometimes the whole process is conducted in a single furnace. In this case the ore is charged into the furnace, mixed with a flux adapted to the nature of the earthy matter under treatment. The heat is kept up till the whole is fused, when the copper, owing to its greater specific gravity, sinks, while the liquid earthy matter or slag floats upon its surface. This slag is now drawn off the face of the copper by means of rabbles, and the metallic bath is exposed. During the fusion, the copper has of course absorbed oxygen, which, if allowed to remain, would render the metal, to a great extent, fragile. The surface is, therefore, covered with charcoal, and rods of green wood are plunged into the metallic bath, in order to reduce the oxyd. The refining being completed, the metal is ladled out, and poured into molds.

At other times, two furnaces are used, and in that case the metal is first obtained in the form of pigs, which are afterwards refined. The slag taken from these furnaces are very rich in copper, containing numerous shots and flakes of copper diffused through them. They are therefore worked over again with an additional quantity of flux, in order to obtain as much as possible of this retained metal. Still the slag is found to contain too much copper to be thrown away. In order to obtain this, the slags are passed through a small cupola furnace. The resulting slag may be considered clean, but there has been an unavoidable waste of copper, which has volatilized at the high heat of the cupola and passed out of the chimney.

The establishments at which the Lake Superior copper is worked are at Detroit, Cleveland, Pittsburgh and Boston.

APPLICATIONS FOR THE EXTENSION OF PATENTS.

Mode of Performing Surgical Operations.—W. T. G. Morton, of Boston, Mass., has applied for the extension of a patent granted to him on the 12th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 15th of October next; and the petition will be heard at the Patent Office on the 29th of that month.

Cider Mill.—George W. D. Culp, of Allensville, Ind., has applied for the extension of a patent granted to him on the 14th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 16th of October next; and the petition will be heard at the Patent Office on the 29th of that month.

Harvester.—Andrew J. Cook, of Enon, Ohio, has applied for the extension of a patent granted to him on the 20th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 22d of October next, and the petition will be heard at the Patent Office on the 5th of November.

PROGRESS OF POPULATION IN NEW YORK.

In the year 1805, an ingenious individual, who was fond of figures, finding that the population of New York at that time numbered 75,700, and that it had increased at the rate of 25 per cent per annum for the previous five years, went on, from that number and from that ratio, to predict the population of New York in future times; and the following table shows his figures, as published in Valentine's *Manual of the Common Council*:—

1805	75,700	1835	289,035
1810	94,715	1840	361,293
1815	110,390	1845	451,616
1820	149,907	1850	564,520
1825	184,903	1855	705,650
1830	231,228	1860	882,062

The number (882,062) for 1860 will perhaps come within 10,000 of the census. Calculating upon such a basis, what will be the future of New York in the year 1900? Its population will be 5,257,493, or twice that of the present population of London. In 40 years from the present date, if the same rate of increase continues, New York will be the largest city in the world.

A LADY in an omnibus at Washington espied the great unfinished dome of the capitol (which don't look much like a dome at present), and said, innocently, "I suppose those are the gas-works?" "Yes, madam, for the *nation*," was the reply of a fellow-passenger.

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OUR WESTERN CORRESPONDENCE.

Blowers in the Cars—John Bull's Line—The Grain Mart of the World—Douglas Men on the Track—The Iron Horse and other Cattle—The Future of the West—A North and South Pole Railroad.

KANSAS CITY, Mo., Aug. 9, 1860.

MESSRS. EDITORS:—The route westward over the New York and Erie Railroad is so familiar to your readers that I shall say nothing about it, further than to add my meed of commendation regarding the excellent dust-excluding and ventilating arrangements to be found in the "ladies' car" attached to the express train. It is a great comfort to travel in a carriage thus fitted-up; if the public were properly schooled in these matters, they would soon make railroad managers sensible, by the most convincing of all proofs—the pocket—that it is futile to think longer of cramming forty or more persons into those flying abominations, the unventilated railroad cars. Travelers would learn quickly to discriminate between lines in this respect, and would best patronize those which supplied oxygen the most liberally. It might be as well for the railroad dignitaries to recollect that unmarried men have lungs as well as those blessed with "better halves;" and that as they pay the same fare, the aforesaid ventilating apparatus should be applied to the gentlemen's cars as effectively as to those of the ladies.

I went by the way of Buffalo and the Great Western Railroad of Canada. No sooner was that line reached than the hand of "John Bull" was apparent. The track was better ballasted and boxed over; the stations neater, and the signal apparatus on a more complete scale than we generally have such things "on our side of the fence." As far as could be judged from the motion of the train, the alignment and surface of the track must have been in very fair order. Take it altogether, this line is quite creditable to our neighbors. They have had some ugly accidents on that road, however, in their time, as many of your readers may recollect.

Night-fall brought us to Detroit, and next morning found us rattling along towards Chicago—that wonderful city of the West. It is wonderful indeed, even for American progress, when we recollect how few years have elapsed since it was a marshy waste, but that now it is the greatest grain mart in the world! If the railroads of Illinois have not been very profitable investments for their stockholders, they at least have built up Chicago and made the State what she is now—one of the finest agricultural countries of America; so that the resident stockholders may well afford to regard their share subscriptions as so many donations to improve property; and viewed in this light, they have been amply repaid. It is a question, however, if "Cousin John," over the water, would consider the increased prosperity of Chicago, and the State generally, sufficient indemnification for the "pile" that *he* sunk in the great Illinois Central Railroad. A union depot would be a great convenience in that town: it is a perfect nuisance to have to go half across the city from one terminus to another and pay for the undesired omnibus joltings too, even if you have a through ticket, which I was verdant enough to suppose covered all expenses of carriage of "self and baggage" to the end of the journey.

I took the Chicago, Alton and St. Louis Railroad to the last-named city. Our express train was almost empty in consequence of an excursion train which left the city just after us, filled to overflowing with the admirers of Judge Douglas, who were to hear him speak at Joliet. Though the SCIENTIFIC AMERICAN deals exclusively in machinery and is *some* on "wire-working" too, it is not just the kind of machinery or wire-working that is used in president-making; so we will leave the politicians cheering themselves hoarse in the cars at Joliet, and proceed on our way. Nothing worthy of note occurred on the trip, except that we knocked over a horse and a cow at different points on the road, in the most artistic manner. The engineer (I presume) is an adept in this department of his business, and fully sure of the "stand-up" qualities of his engine when engaged in an encounter of this sort; for I don't think he even blew his whistle to check the speed of the train on nearing his unsuspecting antagonists, one of whom was instantly thrown *hors de combat*, and the other (I suppose) considerably *cowed* in spirit by this very striking occurrence. I did not see the cow, but as I chanced to be looking out of the open window, I saw the discomfited horse struggling on his back in the ditch, and that was the only way I knew what had occurred. A little while after this, however, while at a station, a bystander said to the engineer: "I expected that the cow you struck would have thrown you off the track." Possibly we may have forestalled the butcher in some other instances; but western engineers take no notice of such trifling obstacles as stray cattle. Can they be called cow-ards?

Five weary days on the Missouri river between St. Louis and Kansas City! O, those miserable-looking little river towns, with their squalid, listless population! Every man, woman and child is a peripatetic advertisement of "fever and ague on short notice." Yet—if we are to believe the assertions of men interested in the growth of these gloomy spots—*all* these pigmy places are destined, at some future time, to be the mammoth and magnificent termini of important railroads or the shipping ports of vast sections of highly-improved country. A western man will stand a good deal of talking till you say anything against his own town; then he's *up*! Tell him it is Paradise or the nearest approach to it that is practicable here below, and he "chimes in" with you; but demur at all to his laudations of his favorite, and he at once conceives a very poor opinion of your mental caliber, especially in the art of "prospecting." There are, of course, some exceptions—some go-ahead places; and considering its very infantile years, Kansas City has shown as much vigor as any. I never saw a more unfavorable town site; yet by great exertions and the heaviest grading I almost ever met, the inhabitants have done much to remedy the evil. They certainly have shown most indomitable energy, but I fear the present generation will not be repaid for their outlay, though I hope such courage as they have shown may not go unrewarded. It was its geographical position with regard to the western and south-western trade that caused it to be selected; it is a great pity that Wyandotte City (close by) could not have been fixed on instead, because one-fifth of the money that has been spent on Kansas City would have made Wyandotte City a fine town; but the territory was not then open to settlement.

The people of Kansas are projecting a railroad from this town in a northerly direction to tap the Hannibal and St. Joseph Railroad; you would never guess the name they have selected for this little line. Nothing less than the Galveston (Texas) and Lake Superior Railroad! They are great on nomenclature, any way. I suggested a change to a name still more imposing and quite as appropriate as the one chosen, namely, the North Pole, Kansas City and South Pole Railroad; the proposed line is just as much a "link in the chain" on the one road as it is on the other.

E. M. RICHARDS.

HOW TO POISON WHALES.

A paper has just been published (in England) by Professor Christison, on the result of some experiments suggested as long ago as 1831, by Messrs. W. and G. Young, of Leith, for the capture of whales by the means of poison, the agent being hydro-cyanic or prussic acid. The subtle poison was contained in tubes, in quantity about two ounces. Among other difficulties, one was to discharge the poison from the tubes at the right time. After various trials, the plan fixed upon was to attach firmly to each end of the harpoon (near the blade) one end of a strong copper wire, the other end of which passed obliquely over the tube, thereby securing it in its place; then through an oblique hole in the shaft, close to the upper end of the tube, and, finally, to a bight in the rope, where it was firmly secured. By these means the rope could not be drawn tight (as it would be when the harpoon attached to it struck the whale) without crushing the tubes; the poison would then enter the whale, and death ensue. Messrs. Young sent a quantity of tubes charged with the poison by one of their ships engaged in the Greenland fishery, and on meeting with a fine whale the harpoon was skillfully and deeply buried in his body; the leviathan immediately "sounded," or dived perpendicularly downwards, but in a very short time the rope relaxed, and the whale rose to the surface quite dead. The men were so appalled by the terrific effect of the poisoned harpoon, that they declined to use any more of them.

INTERESTING CORRESPONDENCE.

We present the following letters from our correspondents, and shall be pleased to receive any practical suggestions which any of our readers may have to make in regard to any of the statements or inquiries contained in them. Correspondents sending such suggestions, however, will please to particularly comply with the request embodied in the note published at the head of our column of "Notes and Queries":—

DEAFENING WALLS.

MESSRS. EDITORS:—Having read an article in your valuable journal of the 4th inst., headed "American Architects—Attention!" it struck
of walls &c., might be effectually accomplished and at a small expense by an aerated paste of plaster-of-paris, poured into the spaces between the walls or floors; this would set immediately, and I think the cells would prevent sounds passing through. The paste might be, I think, aerated so that the substance would be very light.

J. M.

St. Johns, N. B., August 20, 1860.

[This may answer very well between walls, but it would be rather expensive, we think. Between floors, it would be liable to crack, and, in the course of a few years, would cause any house to become very dusty.—EDS.

STICKY INDIA-RUBBER GOODS.

MESSRS. EDITORS:—India-rubber goods frequently stick together in this warm climate. Even fine silk coats delicately covered with india-rubber will, when hanging up in the wardrobe, stick together, wherever parts come in contact. Can this be remedied? Is there anything that will harden particular parts that seem to have dissolved and to have thus become very tenacious. If there is, please inform the public through your paper.

W. H.

Mobile, Ala., August 24, 1860.

[Here is an important subject for the manufacturers of such goods. There is a great defect to be remedied, and an improvement must be made to obviate the evil.—EDS.

COATING FOR PATTERNS USED IN MOLDING.

MESSRS. EDITORS:—I take the liberty of asking you what is the best and cheapest article to coat iron or wooden patterns, for molding in sand, for brass or iron castings. We have generally used beeswax, but find it very expensive, and are anxious to get something that would cost less and equally answer the purpose.

E. W.

St. Johns, N. B., August 22, 1860.

[We really are not acquainted with a substitute that is any better than wax; perhaps some of our readers may be able to furnish one.—EDS.

NATURAL VARNISH TREE.

MESSRS. EDITORS.—There is in the south part of this cape, a small tree which on being bored like the maple, exudes about one quart of natural varnish in each season. I mixed some alcohol with it, and it made a beautiful varnish for wood; but it turned white when wet. What shall I put with it to make it impervious to water; and if it should prove successful, what would it be worth (per barrel) in New York?

G. S.

Jacksonville, Fla., August 16, 1860.

[We cannot tell what would be the value of such a varnish in this city; that would all depend on its quality. All varnishes made with alcohol, or with alkalies, are liable to become whitish-opaque, when subjected to the action of water. Varnishes made with boiled linseed oil are not affected in that manner.—EDS.

BLASTED WHEAT.

MESSRS. EDITORS:—Will some of our scientific friends tell us the cause of wheat being "blasted" when sowed as a succeeding crop to corn, while it flourishes as a succeeding crop to *oats*; does corn exhaust the qualities of the soil for wheat more than oats? This interrogation I know belongs to agricultural journals, but is it not also a scientific question? An answer will much oblige an old subscriber.

S. C. C.

Brush Creek, Iowa, August 20, 1860.

[We do not know why wheat should be blasted when it succeeds a corn crop and not an oat one, and there is not a scientific person in the country who can tell. But is our correspondent sure that such really is the case? We rather think that this is a popular prejudice prevailing in some portions of the country, without any solid foundation in facts. This question requires further investigation. In Illinois and other States, good wheat crops have been obtained in succession after those of corn.—EDS.

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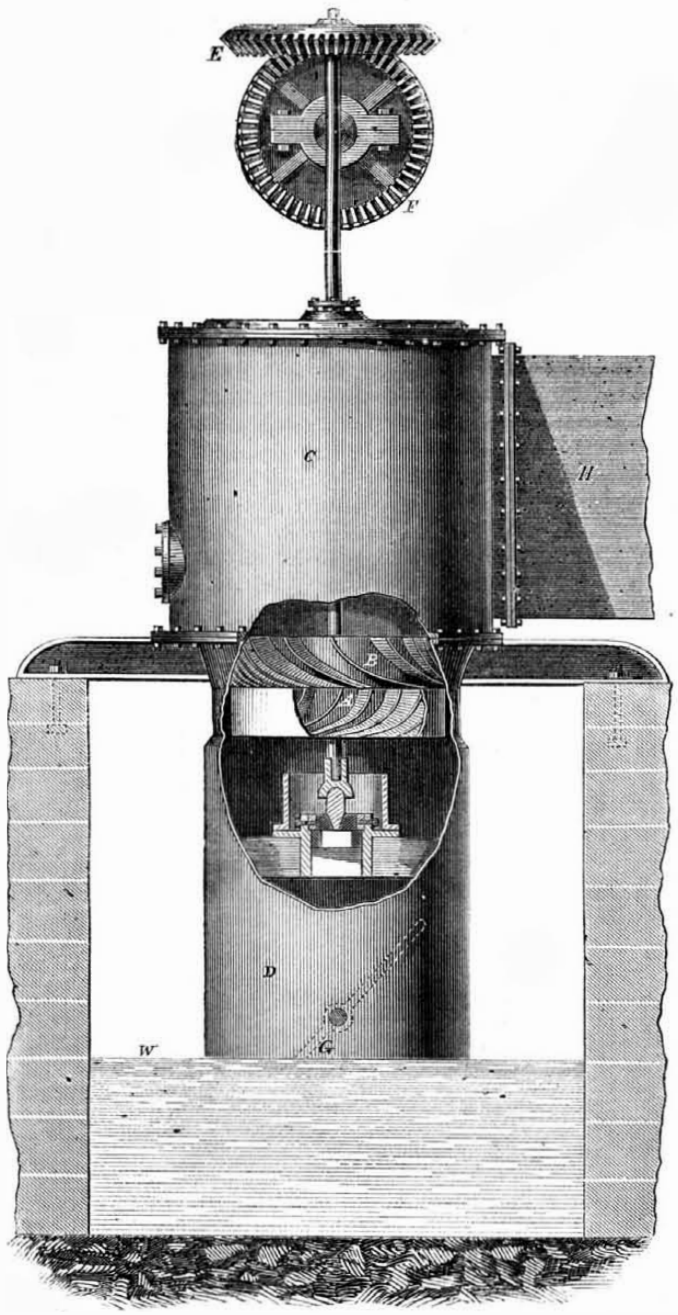
PHILADELPHIA WATER WHEEL EXPERIMENTS.

MESSRS. EDITORS:—Before giving a description of the accompanying engraving, it will be well to state the object of the late trial of turbine wheels at the Fairmount Water Works, and also describe the apparatus and the manner of testing, &c. The principal objects aimed at in the trials were, to ascertain the wheel best adapted to the location and the work of pumping, and also the one that would give the greatest ratio or per-centage when working at its maximum power. The head and fall at Fairmount vary, with the tide, from 8 to 12 feet; and the new wheels were each to be of the power to drive two double-acting pumps of 6 feet stroke and 18 inches bore, at a velocity from 10 to 16 revolutions per minute, raising the water 120 feet to the reservoir. The power of the wheels would be, on an average, that of 125 horses; and as their velocity would be much greater than that required for the pumps, the speed would have to be reduced by a combination of gearing. The head chosen for the trial of the model wheels was 6 feet, and the same combination of gearing was used to reduce the speed to the barrel shaft as would be required for the large wheels. The model wheels were to discharge 200 cubic feet of water per minute under the 6-foot head, but the size of the wheel was left to the judgment of the maker. The manner of testing was the raising of a weight to a certain hight and measuring the water used by the wheel in the given time; and in order to do this an apparatus was constructed, which consisted of a receiving tank and penstock to which was attached a box answering the purpose of a wheel-pit, in which the wheels were placed and secured to the penstock. Below the wheel-pit was the measuring tank, into which the water was discharged from the wheel while the weight was being raised This tank was just 5 feet square and perfectly level. To the outside, and communicating with the inside, there was attached a glass tube and a graduated scale, to mark the exact hight of water in the tank. Leading from the weir or overflow of the wheel-pit, and directly over this tank, was an open spout or conduit, arranged with a gate in such a manner that, at a given signal, the water discharging from the wheel could be instantly turned into the tank, and as quickly checked. Above and over the wheel-pit a shears was erected, and on the top was placed a sheave about 2½ feet diameter, over which a rope passed from the drum to the box containing the weight below, giving a hight of about 50 feet for the weight to rise.

The wheel being set in its place and the rope attached to the barrel shaft being extended over the sheave to the weight below, the wheel was started and the weight raised a short distance, and there held to straighten it. A distance of 25 feet was measured-off by a line, and two signal marks tied to the rope; a stationary signal point was also fixed for these to pass, and all was so arranged that by the wheel running a certain time, and the weight steadily rising, the water was instantly turned into the registering tank below, at the first signal, and at the second it was quickly turned from it, and the hight of water in the tank was then noted down. In order to avoid error in the working of the apparatus, each weight was raised successively three times, and the average amount of water was taken as one experiment. In the case of the wheel here described there were 13 experiments with weights from 750 to 1,100 pounds, varying 25 pounds each. The time varied from 20 to 30 seconds, and the greatest result produced was .8777 per cent, or 925 pounds raised 25 feet by 70.25 cubic feet of water, under a head and fall of 6 feet [$(925\times25)\div(70.25\times62.5\times6)=.8777$]; to this must be added the friction of the transmitting machinery, estimated at 3 per cent, making a total useful effect of .9077 per-cent of the power employed. The average per-centage of the 13 experiments was $.8483+.03=.8783$. The transmitting machinery consisted of one pair of bevels of 17 and 69 teeth, a counter-shaft, and one pair of spur weeels of 60 and 96 teeth, and barrel shaft, also



STEVENSON'S JONVAL TURBINE WATER WHEEL.

the pulley shaft on top of shears, reducing the speed from 20 to 24 revolutions of drum shaft per minute.

The accompanying engraving is a representation of the turbine. H is the trunk for conveying the water into the case or penstock. D is the draft box or suction tube, which, together with the case is partly broken away to show the movable wheel or turbine, A, the stationary or guide wheel, B, and the bridge or step arrangement. G is a gate inside the draft box, and it is operated by a lever. E F are bevel gears. The draft box is an air-tight tube inclosing the wheel and extending down into the tail-water, W, to a depth sufficient to prevent the air from entering and destroying the partial vacuum or draft upon the wheel. A wheel of this kind, located between the two levels of the fall, gets its power from below as well as above; by opening the gate, G, the whole column is set in motion; the water entering the case above through the trunk, H, on one side, takes a circular motion around over the stationary or guide wheel, B, in the direction of the wheel's motion, thus giving the momentum of water entering the case to the wheel, and at the same time equalizing the pressure on all the buckets. This is a new feature of the Jonval turbine and is considered a good one for maximum power wheels, and especially where the water has to be conveyed a long distance to the wheel, as a much smaller trunk or pipe can be used, and considerable expense saved. But the same results will be produced where the water can be brought in over the wheel in a large body at a reduced velocity by a proper construction of the guides. The great per-centage of power obtained by this over the other Jonval wheels, at the late trial, was produced by the difference in form and curve of bucket and guide and the proportions of the wheel generally. It was a strong, practical working wheel, 22 inches in diameter, with well-finished brass buckets, a step of *lignum-vitæ*, 2 inches in diameter (the usual size for such wheels), and the journals of the shafts were 1½ inches in diameter by 5 inches long. This wheel can be built in different forms to come within the means of all manufacturers, and it affords, at the same time, a first-class power. J. E. STEVENSON, Millwright.

Novelty Iron Works, New York, Aug. 25, 1860.

OUR WASHINGTON CORRESPONDENCE.

WASHINGTON, D. C., August 25, 1860.

MESSRS. EDITORS:—The great hall of the new western wing of the Patent Office is now completed, and the rejected models (nearly 50,000 in number) have been therein deposited and classified. The hall is 270 feet long and 64 feet broad, unobstructed by supporting columns, and paved with black and white squares of marble. It forms a most elegant and spacious apartment, and, as a specimen of good architecture, it is truly a credit to the country.

The models are placed in iron-framed cabinets arranged near the walls, and they present a very neat and attractive appearance. How immense the sum of toil and study which these silent, rejected models represent!

The hall of the eastern wing having become filled to overflowing with patented models, the southern wing, also, is now being occupied by them; but as this apartment is comparatively small; more space will soon be required. It is hoped that Congress, at its next session, will pass the bill authorizing the return of the rejected models to their respective owners, and thus provide room for the patents.

The northern wing of the Patent Office, lately finished, is occupied by the Census Bureau and Land Office clerks.

The open court-yard inclosed by the four wings of the building—a small park in size—has been laid-out with walks and beautifully grassed over. Two pretty fountains, supplied from the Potomac, adorn the inclosure with glittering jets.

Patent Office Report for 1859.—The first volume containing printed matter was issued some time ago. The two remaining volumes, containing the drawings of all the patents for the year, will be published in the course of three months. Through the favor of the librarian of the Patent Office—Professor W. E. Jillson—we have been enabled to examine some of the proof-sheets of the drawings. They are printed from photographic plates prepared by a method secret with the contractor, Mr. E. P. Jewett, of Buffalo, N. Y. The printed specimens that we have seen are well-done—better, indeed, than might be expected, considering all the circumstances. The original drawings were furnished by the Patent Office, and were done by hand, in pencil; but on so dimunitive a scale that it was found necessary to enlarge them. The bits of paper containing the drawings were then pasted upon stiff sheets, each having as many pictures as was necessary to constitute a page of the book. The drawings, thus arranged, were enlarged, several at a time, by the photograph, and thus reproduced upon metallic plates, ready for printing. With such a practical evidence of the convenience and success of the photograph in copying drawings, we wonder that the Patent Office does not at once discard the present clumsy and costly system of hand labor. Reducing by hand, and then enlarging by the photograph, seems like putting the cart before the horse. Why not use the photograph to start with, and thus produce far better originals, of the exact size required, at a less expense and all at one operation? The ascertained cost

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of copying linear drawings by the photograph is only about *one-tenth* as much as the hand system. Such are the results obtained at the Ordnance Office in England, in which a saving to the government of $200,000 per annum has been effected by the adoption of the photograph for this particular purpose.

Professor Jillson has arranged a single index to the Patent Office report, by which the name of each patentee, the number of his patent, the pages of the drawing and claim, are all exhibited at a glance. This is an excellent improvement. Heretofore, it has been necessary to consult two separate and inconvenient indexes.

B.

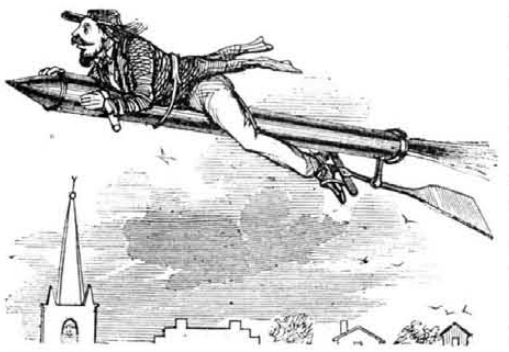
FLYING MACHINES IN THE FUTURE.

Of all inventions of which it is possible to conceive in the future, there is none which so captivates the imagination as that of a flying machine. The power of rising up into the air, and rushing in any direction desired at the rate of a mile or more in a minute, is a power for which mankind would be willing to pay very liberally. What a luxurious mode of locomotion! To sweep along smoothly, gracefully and swiftly over the tree tops, changing the course at pleasure, and alighting at will; how perfectly it would eclipse all other means of

travel by land and sea! This magnificent problem, so alluring to the imagination and of the highest practical convenience and value, has been left heretofore to the dreams of a few visionaries and the feeble efforts of a few clumsy inventors. We, ourselves, have thought that, in the present state of human knowledge, it contained no promise of success. But, considering the greatness of the prize and the trifling character of the endeavors which have been put forth to obtain it, would it not indeed be well, as our correspondents suggest, to make a new and combined effort to realize it, under all the light and power of modern science and mechanism?

What little attention this subject has heretofore received from inventors has been almost wholly confined to two directions—flying by muscular power and the guidance of balloons. Both of these we have been accustomed to regard as impracticable. But, as Mr. Hyatt suggests, the flying by muscular power is a field of invention which has by no means been thoroughly explored. Though it may be impossible for a man to raise his own weight rapidly by beating the air, the *sustaining* of his weight in the air and moving horizontally is an entirely different problem. In the bird, the wings are moved by the most powerful muscles in the system. Has this hint been acted upon, and the muscles of the legs and shoulders been brought to bear upon the wings in the most efficient manner? Again: has the constancy of the rotary motion been made available in a flying machine? If spiral fans were used, of course, two sets would be required to prevent the machine from turning itself in the direction opposite to the motion of the fans.

But the thing that is really wanted is a machine driven by some natural power, so that the flyer may ride at his ease. For this purpose, we must have a new gas, electric or chemical engine. What we require are two or more substances, solid or liquid, which, by merely being brought in contact, would be converted into gas. Place these in the re-action or Avery engine, which, by running at high velocity, would yield a large power in proportion to its weight, and it is possible—yes, probable—that the machine would drive spiral fans with sufficient force to raise itself from the ground. Would not the binoxyd of hydrogen and charcoal fill these conditions? This engine would run with such immense velocity that the fans would have to be very small; and it is probable that a moderate widening of the arms themselves—giving them a spiral inclination—would be the true plan. There might be two generating vessels,



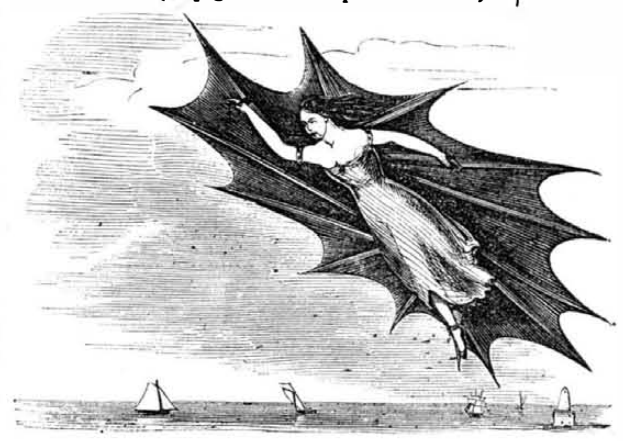
corresponding to the steam boiler; and when one was exhausted, the second might be brought into action while the supply of material was renewed in the first; thus supplying and exhausting them alternately.

The simplest, however, of all conceivable flying machines would be a cylinder blowing out gas in the rear, and driving itself along on the principle of the rocket. Carbonic acid may be liquified, and, at a temperature of 150°, it exerts a pressure of 1,496 lbs. to the square inch. If, consequently, a cylinder were filled with this liquid, and an opening, an inch square, made in the lower end, the cylinder would be driven upward with a force equal to 1,496 lbs., which would carry a man, with a surplus of som ' 350 lbs. for the weight of the machine.

We might add several other hints to inventors who desire to enter on this enticing field; but we will conclude with only one more. The newly-discovered metal aluminum, from its extraordinary combination of lightness and strength, is the proper material for flying machines.

FLYING MACHINES—A BIRD-WOMAN.

Messrs. Editors:—I have seen in your paper an offer of $1,000, from Mr. Hyatt, for the best flying machine; and also (on page 116 of the present volume) a



letter asking for communications on this subject, and I thought I would write to you what I know about it. Six years ago, a friend (a Spaniard) told me that he had once witnessed or read an account of (I don't remember which) the trial of an apparatus for flying through the air. This apparatus was made by an old philosopher, and the experiment was made by his daughter above the bay of Barcelona (Spain); there being numerous boats on the waters of the bay, in case of accident. The experiment was perfectly successful; the young lady circled round and round for many miles, imitating most of the motions of the birds, and landed safely upon the shore. Unfortunately, however, the scientific world was never made aware of this successful experiment in aerial navigation, for the apparatus of the "bird-woman" was ruthlessly seized by the police as soon as she touched *terra-firma;* the authorities considering that her "machine" would be dangerous if made public, and used for unlawful purposes. This happened about 10 years ago. All that "leaked out" in reference to the shape of the apparatus was that it looked something like a bat on the wing, and was made of varnished silk, with some mechanism (to give and direct its motion) operated by the feet and hands of the fair aeronaut.

If Mr. Hyatt or other persons are anxious to learn anything further about this machine, perhaps they can obtain information from the above source.

E. M.

Boston, Mass., August 25, 1860.

[We suppose that the "source" of information to which our correspondent refers is the Barcelona police who seized the flying maid. We imagine that Hyatt would have a "good time" in trying to find out about a matter which seems to have frightened the authorities of Barcelona out of their common sense. However, we give the statement for what it is worth; and if this letter of our correspondent should meet the eye of any member of the police of the above-named city, who was cognizant of the facts above narrated, he will oblige us by communicating the same.—Eds.

HYATT'S $1 000 PRIZE.

Messrs. Editors:—I see by your paper that Thaddeus Hyatt offers a prize of $1,000 for the best flying machine. Now, I would like to know whether there are any conditions affixed to this offer. Is there any particular distance required for the machine to fly? Will a navigable balloon fill the requirement? Must the machine be able to raise a man? Some of us would like to see Mr. Hyatt's offer made more definite on these points.

Of course a practical flying machine, cheap in its construction, and operating at little expense, and which would transport a man unlimited distances through the air with certainty and safety, would be the source of immense wealth to its inventor, and the offer of a thousand dollars for such a machine would be ridiculous. But if Mr. Hyatt is a public-spirited man of wealth, who is ready to pay $1,000 for a *step* towards the acquisition of this greatest boon which science and mechanism can bestow on the human race, it is possible that he may have the opportunity of doing so. I am, gentlemen, one of those inventors who profess to understand that matter is not to be moved without the expenditure of adequate force; and it is my opinion that an offer of $5,000 or $10,000 for a machine that would raise the body of a man from the ground, without any buoyancy of the atmosphere, but simply by beating the air, would call forth more than one competitor, and that the prize would be carried off. It is possible, even, that this thousand-dollar prize may call forth inventions that will fill the conditions if they are sufficiently easy; for instance, if *models* only are required, which will fly with their own weight by their own power in beating the air.

B. G.

New York, Aug. 25, 1860.

Making Cloth Fireproof.—A patent has lately been secured by F. A. Abel, of the Royal Arsenal at Woolwich (England), for a new method of rendering textile fabrics proof against fire. He takes 25 lbs. of sugar-of-lead, and 15 lbs. of litharge, and boils them for half-an-hour in 40 gallons of water, when the liquor is allowed to settle. Any quantity of the clear liquid that will suffice to cover the cloth to be operated upon is now taken, and the cloth is immersed and freely saturated in it, then dried in the open air. The cloth is now immersed for about one hour in a hot, and moderately strong solution of the silicate of soda, then thoroughly washed in cold water and dried. By these operations an insoluble silicate is formed within the pores of the cloth, thus making it fireproof.

Is the Sun growing Cold and Dark?—There are now more spots on the sun than have been seen before for many years; some of these are visible through a smoked glass to the naked eye. Several stars—some of them of great brilliancy, which, from their ascertained distance, must have been as large as our sun—have totally disappeared from the sky; and the question has been raised among astronomers, whether the light and heat of the sun are gradually fading away. As this would be accompanied by the destruction of all the plants and animals on the earth, it is rather an interesting question. The sun's light and heat is diminished by the dark spots at the present time about 1 per cent.

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THE ADAPTATION OF MACHINERY TO PHOTOGRAPHY.

BY G. H. BABCOCK.

[Read before the American Photographical Society, Aug. 13, 1860.]

In this age of steam, telegraphs, and photography, when the three most subtle agencies of nature—light, heat, and electricity—have been subdued by man and trained to do his bidding, startling developments and astounding applications in art and science are looked for as an almost daily programme in the great drama. Is it then to be wondered at, that the go-ahead Yankee, in his impatience at the slowness of this "fast" age, should conceive and actually carry out the idea of applying steam power to the production of photographs and should turn them out at a speed which eclipses the boasted rapidity of the "lightning" printing-press?

As an evidence that this may be and even has been accomplished, I have the pleasure of presenting for the inspection of the society, this evening, several specimens, among them a sheet containing about three hundred photographs all printed from one negative, at the rate of *twelve thousand an hour!* As astonishing as this speed may seem, I am assured, and from what I have seen, believe, that it may be greatly increased.

The means by which this is accomplished is, simply, the adaption of machinery to the process of printing by development. This process, though little used of late, has certainly produced some very fine specimens, and prints so produced are generally conceded to have the advantage in permanency over the ordinary prints produced by the direct action of light.

The machine is the invention of Mr. Charles Fontayne, of Cincinnati, Ohio, who has spent several years in perfecting it, and the developing process which he uses therewith. I am assured by him that the process by which these specimens were produced is quite different from any other known. but in what this difference consists I am not informed. A negative is fixed in a box, together with a sheet of prepared paper, and the latter exposed by automatic machinery to the condensed light of the sun passing through the negative. After each exposure the paper is traversed underneath the negative, to present a fresh surface for the succeeding impression. These motions, together with that of clamping the negative into close contact with the paper at the instant of exposure, are all performed by the operator simply turning a crank.

The rapidity, at the several times I witnessed its operation, was two hundred impressions per minute, at which speed the time of exposure was but .03 of a second for each impression. The condensing lens being seven inches in diameter, and the circle of condensed light about one and a half inches, the above exposure is equal to .65 of a second direct exposure to the light of the sun. If, therefore, the machine were to be used for a larger class of pictures, such as book illustrations and stereograms, a condensing lens might be dispensed with, and yet nearly twenty-five hundred impressions be taken in an hour.

This opens a field for photography hitherto impracticable in consequence of the time and expense of printing as ordinarily practiced. The illustrations for a book, having all the exquisite beauty and perfection of the photograph, may be turned out, by the use of this machine, with a rapidity wholly undreamed of, either in plate printing or lithography. The expense of engraving may be dispensed with, and the negative come direct from the artist's hands, drawn upon a prepared glass, from which, in the course of a few hours, the plates for a large edition may be printed, each one a perfect duplicate of the original drawing. As an evidence of the facility with which this may be done, a print produced by the ordinary ammonia-nitrate process, from a rough sketch so prepared, is herewith presented. It will be seen that an ease, freedom, and spirit is given to the drawing which cannot be equaled by any process of engraving, and when the negative is properly prepared by an experienced artist, nothing further could be desired for illustrating ideal subjects; but for the actual, and for reproducing the works of others, of course, the draughtsman would give way to the far more truthful camera.

But besides book illustrations and portraits for visiting cards, and advertising purposes, of which specimens are shown, this machine may be applied to the multiplication of stereograms, which, by its use, may be made so cheaply as to bring them into the humblest family, where by their exquisite beauty and truthfulness they will engender a taste for the beautiful and, in time, entirely eradicate the cheap and disgustingly coarse lithographs, engravings, and water-color daubs, which at present form so large a proportion of the pictures within reach of the poor.

When these new adaptations of photography shall have been fully accomplished, then shall our noble art, which has already done more to develop and elevate the taste of the present generation than any other one instrumentality, take a stand by the side of its great sister art—Printing—and, hand in hand, will they go forth to educate, enoble, and elevate mankind.

The pictures herewith presented possess additional interest to this society, from the fact that they are taken upon ordinary American writing paper, which was not prepared specially for photographic purposes. Mr. Fontayne first used this paper in his experiments on account of its cheapness, and, having become accustomed to it, he now prefers it to any of the foreign photographic papers. In the course of his extended experiments, he has used almost every variety of American paper, including that made from straw, manilla and cane, with varying degrees of success, and he promises at some future time to present the result of these experiments to this society.

THE PROFITS OF THE ROCK OIL BUSINESS.

The artesian wells in the oil regions of Pennsylvania continue to yield their valuable product, and the sinking of new wells is being pushed forward with eagerness and rapidity. Thomas A. Gale, a resident on Oil Creek, has written a book on the subject, which has been published by Sloan & Griffith, of Erie, Pa. It furnishes the following facts in regard to the cost of digging and working the wells:—

The average cost of digging a well 200 feet deep is from $600 to $700. When there is oil enough to pay, a pump and steam engine to work it are wanted, with an oil vat and sheds to cover the whole. All this will make the outlay from $1,000 to $1,500. The cost of some wells, when ready for working, reaches $2,000. A great margin is needed for what are called "accidents" and "bad luck," but what is, in reality, the result of inexperience in a new business. When a good paying well—a "10-barrel well"—is once ready for working, the expense is light. A very small steam engine requires about two cords of wood a day, and three "hands" are all that are necessary. The following is—

A Calculation for a Twenty-barrel Well.

Three men's wages	$3 00
Two cords of wood	3 00
Twenty barrels	30 00
Carting to railroad	20 00
Freight to New York	9 00
Interest, repairs and sinking fund	75
Total	$65 75
Amount of sales, at 40c. per gallon	$320 00
Deduct cost	65 75
Daily profits	$254 25

From a well of moderate pretensions, the oil can be raised, barreled and freighted to New York for about 12½ cents per gallon.

THE "LAST" MANUFACTORY AT RICHMOND.

A manufactory of lasts and boot-trees has lately been been put in operation in Richmond, Va., being the first of the kind ever established there. The proprietors, Wortham & Co., get their persimmon logs from the Chickahominy Swamp, and some of them are of such a size as to yield 500 pairs of lasts. The Richmond *Enquirer* thus describes the manufactory:—"Outside the door of a frame building you will find two men with a cross-cut saw cutting great persimmon logs into lengths of from 12 to 16 inches; these lengths are transferred to the frame building, where they are split into chunks, and these chunks being hewn with an ax into a very rough outline of a last, are put into a drying kiln, out of which they come in ten days, hardened and ready for the lathe. The lathe is worked by steam, and consists of a frame about three feet high, two feet wide, and five or six feet long, and so constructed that one of the dried chunks, being put near one end of a horizontal axle, is shaped by a knife into a form exactly corresponding with a pattern last placed on the other end of the same axle. The chunk, thus shaped, is removed from the lathe; and the heel and the toe being trimmed, it is then filed, polished off, and the last is complete."

JUDICIAL DECISIONS IN THE GREAT SEWING MACHINE WAR.

The following are decisions rendered on a final hearing on pleadings and proofs in five sewing machine cases which were argued in June last, by George G. Sickles and C. A. Seward for the defendants, before Justice Nelson (Judge Smalley sitting with him), at Cooperstown, N. Y. The arguments occupied about two weeks, and the cases have since been held under adviser ent by the court. The testimony was very voluminous, amounting to nearly 2,000 pages in print. The opinions of the court contain all necessary particulars to enable the subject to be understood:—

UNITED STATES CIRCUIT COURT,
SOUTHERN DISTRICT OF NEW YORK.

1. *Orlando B. Potter and Nathaniel Wheeler vs. James G. Wilson and Alexander C. Stockmar.* 2. *The same vs. George B. Sloat and others.* 3. *The same vs. John B. Gibbs.*

[In Equity.]

Nelson, C. J.—These suits are founded upon two reissued patents to A. B. Wilson, for improvements in the feed-motion of a sewing machine. The original patent for the invention was granted 12th November, 1850. It was surrendered, and two re-issues, numbered 345 and 346, were allowed thereon, both bearing date 22d January, 1856; 345 was subsequently surrendered, and re-issued 9th December, 1856, numbered 414.

Previous to the invention of Wilson, as claimed by the plaintiffs, the material to be sewed had been advanced under the needle or sewing apparatus by the hand of the operator, or fixed permanently to a frame, called, in technical language, a "baster-plate," which was advanced with the cloth by a regular progressive motion to the needle through the agency of suitable machinery. By the former process (feeding by hand), the cloth could be turned at will, so that seams of any given curvature could be sewed; but there was no security for regularity of stitch, except the care and skill of the operator. By the latter, the regularity of stitch was attained; but, from the permanent attachment of the cloth to the baster-plate, a seam with curvatures and angles, at the will of the operator, as the sewing progressed, could not be formed. The object of the improvement in question was to remedy these defects, by causing the cloth to be moved automatically under the needle, and the device so arranged as to admit of seams of any curvature, and, at the same time, secure regularity of stitch. This Wilson accomplished by the machinery and process described in the specification of the patent.

Instead of the baster-plate, the cloth was advanced under the needle mechanically, according to the arrangement, by the joint action of two surfaces between which it was held, an intermittent motion being given to at least one of them, which caused the cloth to progress regularly, securing uniformity of stitch, and, at the same time, permitting the material to be turned by hand so as to sew a straight or curved seam.

The claims in the re-issued patents (numbered 346 and 414), which are in controversy in these suits, are all founded upon this feed improvement upon the previous sewing machines.

The utility of the improvement is admitted; indeed, it is apparent that, without it, or some equivalent which would admit of curved seams to be sewed automatically, the sewing machine, now in almost universal use, would have been comparatively very limited in its operation. It is insisted, however, that Wilson was not the first and original inventor, which objection raises the principal question in these cases.

The persons mainly relied upon—and, indeed, the only persons that can be relied upon, according to the proof, with any plausibility—to prove priority of invention, are Wm. H. Akins, of Ithica, and Leander W. Langdon, of Rochester, N. Y.

The proof is very full and satisfactory that the invention of Wilson was so far matured as to admit of sewing curved seams by way of experiment, as far back as 1848. In April, 1849, its peculiarities were noticed in the Berkshire *Culturist*, published at Pittsfield, Mass.; and in November of that year, a more extended notice of it, with full lithographic prints, was given in the SCIENTIFIC AMERICAN, published in New York and Boston.

Akins himself has been examined as a witness in these cases upon the question of priority of his invention, and he does not carry its date further back than the latter part of the year 1850. He had made, previous to this examination, three affidavits on the subject, but in neither of these does he state that his improvement extended back to 1848; the farthest his affidavits carry its date is the Fall of 1849. And over and above this testimony, the clear and decided weight of the proof confirms the date he gives of the invention, when examined as a witness in the cases, namely, the Fall of 1850. One very decisive fact upon this question is not in dispute; and that is, that the first machine made by Akins after the partnership with Felthousen (which commenced in August, 1850), had upon it the feed of the baster-plate, resembling that of the Lerow & Blodgett machine, which was exhibited in Ithica in the winters of 1849 and 1850.

The feed admitting of curved seams was introduced into the second machine made by him in the Fall of

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1850, some two years after the date of Wilson's improvement, and which was even after the date of his patent. It is remarkable, if Akins had invented the feed improvement as early as 1848, which admitted the sewing of curved seams (an improvement so useful, and which has added so much to the value of the instrument), that some two years afterwards, when he commenced the business of manufacturing the machines, he should have omitted the use of it altogether.

There is another remarkable feature in this claim of Akins. A patent was issued to him and Felthousen jointly (August 5, 1851), as joint inventors, including this improvement. This was upon a model of the second machine made by him. It is agreed that these patentees first commenced business together in August, 1850, and that Felthouson had had no previous connection or interest in sewing machines, nor any knowledge of them. Both must have made oath that they were the joint inventors of the improvement before the patent could issue; and, if true as to Felthousen, the date of the invention must have been later than August, 1850. It is now pretended that Akins was the sole inventor of the improvement of the feed, which, if true, the Patent Office was imposed upon, as it could not properly have issued a patent to Akins and Felthousen, as joint inventors, for an improvement on the sewing machine by one of them. It is said that Akins was the inventor of the improvement in the feed, and Felthousen of the set screw above the needle-arm; if so, then separate patents ought to have issued to each for his own improvement, and not a joint patent to the two. If so issued, the patent is void. This action of Akins and Felthousen in procuring the patent, goes to confirm the view of Akins himself, in his testimony, that he did not invent the improvement until after the partnership with Felthousen, in August, 1850.

We forbear going over the proofs in detail upon this question of priority, and shall content ourselves by saying, after a very careful analysis and examination, the weight of evidence is all one way, and that is against the pretension set up in behalf of Akins.

In respect to the claim of Leander W. Langdon, his own account of his invention is as follows:—That when 13 years of age, and in the service of Daniel Rall, in Rochester, N. Y., some time in the year 1847, he read the description of a sewing machine in a newspaper, and observed, from the description, that the cloth was placed upon pins or sharp points, so that the curve of the seam could not be varied after the cloth was placed upon the pins, and that the idea then occurred to him of making a feed by which the curve of the seam could be varied; that after some weeks he had so far matured his thoughts as to make a feed model out of a shingle. No other parts of the machine were made. Nothing further was done in the way of perfecting his improvement or in adapting it to practical use, till the Fall of 1850, when he commenced the construction of a machine in the shop of a Mr. Wright, in Rochester. The shingle-feed model of 1847 was not preserved as of any value or importance at the time, and has been lost.

He claims that the machine made in Wright's shop in the fall of 1850, was a working machine, and embraced the feed motion devised in 1847. Langdon, in a subsequent examination, attempted to change the time of working upon the machine in Wright's shop, from the fall of 1850 to 1849.

It is quite clear, adopting the most favorable account of the invention of Langdon, as given by himself, that the proof falls short of overcoming the patents of Wilson, and the testimony upon which the originality and priority of his improvements rests. The proof fails as matter of law. "It is not enough to defeat a patent already issued that another conceived the possibility of affecting what the patentee has accomplished. To constitute a prior invention, the party alleged to have produced it must have proceeded so far as to have reduced his idea to practice, and embodied it in some distinct form. It must have been carried into practical operation, for he is entitled to a patent who, being an original inventor, has first perfected the invention and adapted it to practical use. Crude and imperfect experiments, equivocal in their results, and then given up for years, cannot be permitted to prevail against an original inventor who has perfected his improvement and obtained his patent." (1 *Blatchford*, 488, 494, Parkhurst *vs.* Kinsman.)

In this case, the pretended shingle model, containing the feed of a sewing machine, had no provision or arrangement for connecting it with or adapting it to the machine; it was laid aside for years and forgotten till after the improvement by Wilson was perfected, a patent granted, and the working machine had gone into general use.

But, independently of this ground, which we regard as conclusive upon the question, the proofs are overwhelmimg that Langdon's alleged improvement was long after that of Wilson, and even after the issuing of his patent of November 12, 1850.

Even the engine at Rall's, which he pretends to have been engaged in working when he read a description of the sewing machine in a newspaper, and made his shingle model of the feed in 1847, was not erected and put into operation until the spring or summer of 1848. And the clear weight of the evidence is, that he never worked upon a sewing machine till he went to work for Burroughs (in the Fall of 1851) who was engaged in manufacturing A. B. Wilson's machines, and did not commence making a machine for himself, till the Spring or summer of 1852.

Our conclusion is that, upon the whole of the proofs in all the cases, the clear weight of them supports the priority of A. B. Wilson's invention of the feed motion, and consequently the patents founded upon it.

Some objections have been taken in the defense, independently of the question upon the invention, which it is necessary briefly to notice:—

1. An objection that the proper parties, complainants, have not been joined in the suit.

This objection is founded upon the testimony of Orlando B. Potter, who was examined as a witness for the complainants. He states that the suits were commenced for the interest and benefit of the two companies represented by himself and Nathaniel Wheeler, viz.: the Wheeler & Wilson Manufacturing Company and the Grover & Baker Sewing Machine Company; that they have no interest in the suits, except as representatives of the two companies and stockholders therein; that the patents are held by them as trustees of those companies.

The proofs show that the legal title to the patents, and exclusive right to them in the State of New York, are in the complainants; and in a court of law they are the only parties proper to bring the suits.

It is urged, however, that in equity all parties must be joined who are interested in the subject-matter of the litigation.

In one sense, according to the testimony of Potter, these two companies may be said to be interested, but whether so or not, as to require them to be joined in the suit, is not certain. If they are but licensees under Potter and Wheeler, then their interest would not be such as would, in the sense of the law of patents, require them to be joined; and this is the relation they hold to the complainants, as insisted upon by their counsel.

This objection as to parties was not taken in the answer, nor do the proofs on either side seem to have been directed to the question. It has been raised for the first time at the hearing. An effort was made by the counsel for the defense to introduce evidence on the subject at the hearing, but the objection to its reception is too plain to call for any observations. If introduced before the Examiner, the attention of the opposite party would have been called to it, and an opportunity afforded for explanation. These objections, as to parties, are not favored when postponed to the final hearing upon the pleadings and proofs. (1 *Peters*, 299, 306. 13 *Ib.* 375).

2. Objections have also been taken to some of the claims under the re-issued patents of January 22, 1856, Nos. 346 and 414.

The first claim in No. 346 is:—"The method of causing the cloth to be sewed to progress regularly by the joint action of the surfaces between which it is clamped, and which act in conjunction, substantially in the manner and for the purposes specified."

The second:—"Holding the cloth at rest by the needle or its equivalent, in combination with the method of causing it to progress regularly, substantially as set forth."

The third:—"Arranging the feeding surfaces, substantially as specified, in such relation to the needle that they, or one of them, shall perform the office of stripping the cloth from the needle as it rises or recedes from it."

The fourth:—"So mounting and attaching one of the feeding surfaces to some other part of the machine, that it may be removed or drawn away from the other surface at pleasure, as set forth."

Now, it is apparent that all the several claims rest upon and grow out of the main improvement in the feeding apparatus, consisting of the two surfaces clasping the cloth, and advancing it to the needle by the intermittent motion of one of them, and so arranged as, at the same time, to admit of the turning of the cloth, and sewing seams of any practically useful curvature. If this device is novel, and we have already shown that it was, then these dependent combinations and devices may well be maintained.

The same observations are applicable to the claim for a combination, embracing this feed improvement, in the patent numbered 414.

3. An objection is also taken that the defendant's machines do not infringe the improvement of the feed motion of Wilson.

The leading original idea of Wilson, and which he has embodied into his improvement, is the substitution of the two surfaces between which the cloth is clasped or held, for the baster-plate of previous machines, and so arranging these two surfaces that one of them, by an automatic intermittent motion of one or both, would advance the cloth to the needle, and at the same time admit of its being turned by the hand, so as to sew curved seams. Now, it is quite clear that this conception, which has remedied a great defect in previous machines, by getting rid of the frame upon which the cloth was fastened, and which could move only with the frame or baster-plate, and hence, practically, could sew straight seams and fixed curves only, was capable of being embodied into a working machine in various modes and forms. A skillful mechanic, by mere skill and without the use of the inventive faculties, could embody it and adapt it to practical use by different mechanical devices. This requires ingenuity, simply, not invention. But so long as Wilson's ideas are found in the construction and arrangement, no matter what may be its form or shape or appearance, the party using it is appropriating his invention and must be held an infringer; and within this view we are satisfied the machines of the several defendants must be regarded violations of the patents in question.

Upon the whole, after the best consideration we have been able to give to these cases, we are satisfied that the complainants are entitled to a decree for the infringements and for injunctions, and reference to a Master to take an account.

UNITED STATES CIRCUIT COURT,
SOUTHERN DISTRICT OF NEW YORK

1. *The Grover & Baker Sewing Machine Company vs. George B. Sloat and others.* 2. *The Same vs. John B. Gibbs.*

[In Equity.]

Nelson, C, J.—These suits are founded upon Letters Patent granted to W. P. N. Fitzgerald, dated 19th December, 1854, as assignee upon the invention and application of A. B. Wilson. The invention consists of an improvement of the feed motion of Wilson, embraced in his re-issued patents, Nos. 346, 414. The surface moving the cloth by its intermittent motion to the needle is caused to drop from the cloth in its return, to again seize it and advance for another stitch. The effect is to free the cloth from the surface in its return, with a view to again advance it.

The novelty of this improvement is disputed by the defendants.

The proof carries back this invention by Wilson (that is, his conception of the idea and embodiment into a model) to April or May, 1850; and it was introduced into a working machine as early as 1852.

The only improvement of the kind seriously claimed by the defense to be earlier than Wilson's, is that of Leander W. Langdon. We have had occasion to examine the claims of this person, generally as to the date of his invention of the feed motion in sewing machines, in a case between Potter & Wheeler against these parties, and to express our opinion on the subject.

In respect to this particular improvement, it is quite clear, upon the proofs, that Langdon never embodied it into a machine till after the year 1852, and after he had seen it in one of A. B. Wilson's machines.

Several objections have been taken in this suit by the counsel for the defendants, independently of the question upon the novelty of the invention.

1. It is insisted that the plaintiffs, by their charter in the State of Massachusetts, are incapable of using the invention in New York, inasmuch as the charter confines their operations to the city of Boston and county of Suffolk, in that State. But we do not so construe that charter. Although a Massachusetts corporation, the right to manufacture the machines is general and not confined to the limits of that State, and there is no prohibition upon it by the laws of New York. (13 *Peters*, 519.)

2. It is objected that the Wheeler & Wilson Manufacturing Company should have been made parties. This objection is founded upon a clause in the assignment of Fitzgerald, the patentee, to the plaintiffs, which is as follows: "subject, however, to an assignment this day made by me, the said Fitzgerald, of the right to use said invention, concurrently with the said Grover, Baker & Co., unto the Wheeler & Wilson Manufacturing Company, to which, for the terms therein, reference is made."

The answer to the objection is that the Wheeler & Wilson Manufacturing Company are only licensees according to the recital under the patent, and therefore have no interest capable of affording the foundation of a suit.

3. The next objection is, that the Fitzgerald patens recites that "the operative parts of this machine and itt construction are substantially the same as those described in Letters Patent, bearing date 15th June, 1852, granted to N. Wheeler, A. B. Wilson, A. Warren and G. Woodruff." The defendants claimed the right, on the hearing, to produce the patent of the 15th June, 1852, and to show, from the recitals in it, that the improvement in question had been assigned by Wilson to the four persons above mentioned. Hence, that Wilson had only one-fourth of the invention at the time he assigned to Fitzgerald, and that he acquired only this interest, and could convey no greater interest to the plaintiff.

This objection was not taken in the answers of the defendants, nor was it the subject of examination or inquiry before the examiner.

As the patent of 1852 was not produced by the defendants before him, and the facts stated in the recital referred to and relied on then and there, the plaintiffs have had no opportunity for explanation; and even if the position of the counsel is well founded, it is impossible to so determine upon the proofs before us.

The objection comes too late, as well as the production of the patent of 1852.

4. It is further insisted that a device, described in a caveat filed by Wm. H. Johnson, November, 1848, and in a patent issued to him 7th March, 1854, contained the principle of this improvement of Wilson. But it is only necessary to read the description, and examine the model of this machine, to see that the device has no resemblance to that of Wilson in this improvement in question.

Without further pursuing the examination in these cases, we are satisfied that the plaintiffs are entitled to a decree for the infringement and for the injunctions, and reference to a Master to take an account.

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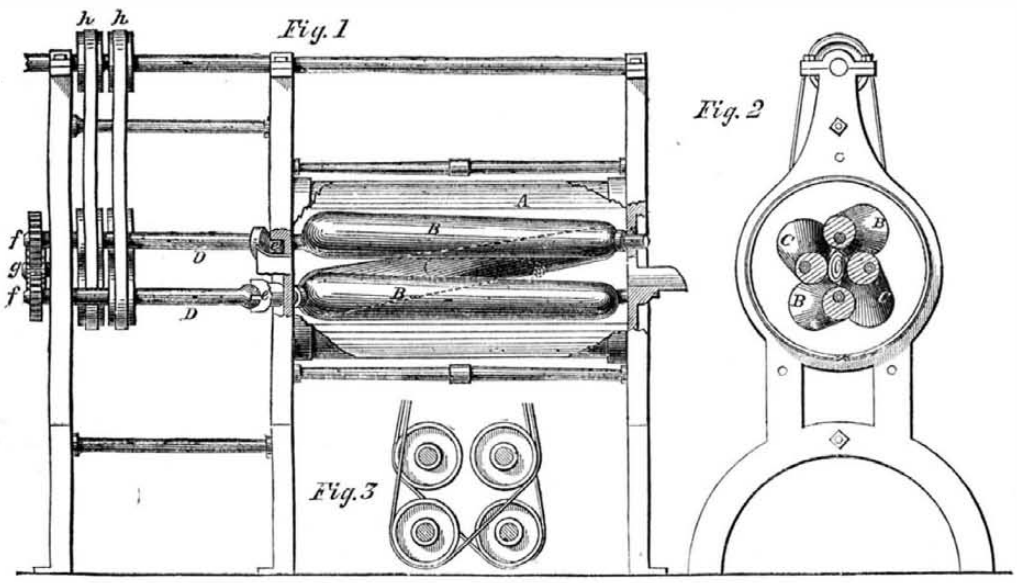
IMPROVEMENT IN FELTING MACHINES.

There is probably no operation in the mechanic arts which has so baffled the efforts of inventors to perform it by machinery, as that of felting, and the success that has finally been achieved is due to the longest and most persistent course of study and experiment, affording striking evidence that there is no merely mechanical operation, however complicated, beyond the power of mechanism to perform.

The invention here illustrated is the last yet made in this long series, and relates to one of the details in the construction of felting machines, effecting, however, an important modification in the manipulation of the felt. Within the hollow cylinder, A, are placed the four conical rollers, B B and C C (Figs. 1 and 2), being hung on journals eccentric to their axes; the journals of the rollers, B B, being in two horizontal planes, and the journals of the rollers, C C, being in two vertical planes, as shown in Fig. 2. The journals are connected at their ends, *e e*, by universal joints, with the shafts, D D, which have at their ends the pinions, *f f*, gearing into a common central cog wheel, *g*. Each shaft, D, is also provided with a pulley around which the belts, *h h*, pass, as clearly shown in Fig. 3. The hat-body or other article to be felted is placed between the rollers at their smaller ends, and is pressed into the oval form shown in Fig. 2, by the eccentric hanging of the rolls. As the rolls are rotated, the felt is carried along, its long axis constantly revolving, thus producing that peculiar motion of the fiber necessary to the operation of felting. The improvement here described consists in the eccentric hanging of the rolls, and it is said to produce excellent work, decidedly superior to that produced by the felting machines heretofore in use.

The patent for this invention was procured, through the Scientific American Patent Agency, on May 8, 1860, and further information in relation to it may be obtained by addressing the inventor, Martin R. Lemman, at Columbus, Miss.



LEMMAN'S IMPROVED FELTING MACHINE.

ANTIDOTE FOR OVER-DOSES OF CHLOROFORM.

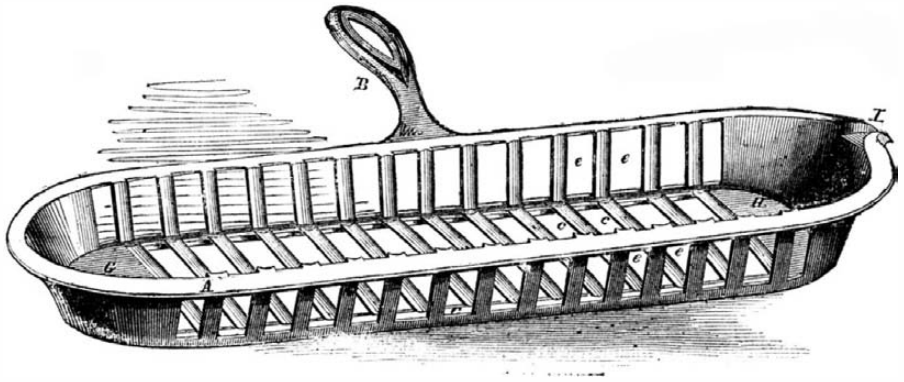
M. Ozanam of Paris, has been making experiments in the use of oxygen to arrest death from an over-dose or from the incautious use of those precious resources of medical science. In all his experiments, M. Ozanam found that the animals awoke in one-half less time after inhaling oxygen than with simple atmospheric air. The result was just the same whether ether or chloroform had been used. Several animals were placed under the influence of chloroform until the beating of the heart was imperceptible and death was eminent, but on inhaling oxygen they quickly awoke. In one of the experiments the animal respired at the same time the vapor of ether and pure oxygen. It was twelve minutes before sleep was induced, and then it was so light that the animal awoke in a minute and-a-half, without the continuation of the oxygen. When chloroform and oxygen were breathed together, the animal became drowsy after eight minutes, but did not sleep, and after the inhalations were stopped, perfectly recovered in a few seconds. M. Ozanam believes that so long as respiration has not entirely ceased, the rarifying effects of oxygen will be produced, and recommends that the surgeon should always have at his command a supply of oxygen to reanimate his patient in case of accident. The Prussian physcians, however, are by no means sanguine of this treatment. They are therefore going to give it further trials before they make a full report on the subject,

EXHIBITION OF A GREAT ACAMENE LAMP.

The reduced price and enormously increased consumption of coal oil has rendered the production of a lamp which will perfectly burn coal oil a desideratum of the very highest importance, and has arrested the attention of numerous inventors to the subject. One of them—W. H. Racey, of this city—has expended no less than $20,000 in experiments, and has finally produced a lamp which does really burn coal oil well, without any chimney, producing a beautiful light, free from smoke or smell. The air is brought through a perforated plate on the sides of the flame, and and is heated before it comes in contact with the flame, thus insuring perfect combustion. The lamp is now on exhibition at the office of H. Eagle, 254 Canal-street, this city.

BROOKS & GROVER'S IMPROVED GRIDIRON.

In broiling meat on hard-coal stoves or ranges, the fat is apt to drip into the fire, and, flashing up, to smoke the meat and scorch it upon the lower side; at the same time, filling the house with an unpleasant odor. To remedy these inconveniences, and to secure a neat and rapid broiling, giving the meat a clean, juicy and delicious flavor, the improved gridiron here illustrated has been devised.



BROOKS & GROVER'S IMPROVED GRIDIRON.

The flange, A, rests upon the top of the stove around the opening in which the bars, *e e*, are suspended, two or three inches below, by the vertical or inclined bars; it being designed that the heated air should be drawn through the openings, *e e*, between the vertical bars in its passage to the flues, thus partially cooking the top of the meat at the same time that the bottom is being cooked. The bars are surrounded by a trough, *f*, in the usual manner, for collecting the juices of the meat, and are curved upward in the middle and grooved for conducting the gravy into the trough. The trough, *f*, is widened out to a broad pan at G, for frying the fatty portions of the meat, which are cut off and placed in this pan for the purpose; thus preventing them from being burned and smoking the meat. The trough is deepened at H, and furnished with a spout, I, for pouring-off the gravy.

The inventors claim that the hot air, passing over the upper side of the meat, closes its pores, preventing the escape of its juices; that the separation of the fat prevents the smoking of the meat, and that the whole arrangement of the gridiron secures the more rapid and perfect cooking of the meat, whereby it is rendered more juicy, all smoking and scorching completely avoided, and its flavor greatly improved. At the same time, the odor of the cooking meat is prevented from spreading through the house.

The patent for this invention was granted on July 24, 1860; and further information in relation to it may be obtained by addressing the patentees, Brooks & Grover, at Rochester, N. Y.

WATER CISTERNS.

The city of Venice is supplied with rain water, which is carefully collected in cisterns and filtered for both public and private use. There are no less than 2,000 large public cisterns in the city, and these supply the inhabitants generally with good, pure water. A description of their construction was recently given by M. Grivand in an address before the Paris Academy of Sciences. In the first place a hole is dug about 10 feet deep (the nature of the soil prevents a greater depth), and in shape of an inverted truncated pyramid. The earth surrounding the sides is kept in its place by a strong wooden frame, which covers also the bottom of the cistern. Upon this is applied a layer of compacted clay, the thickness of which is in proportion to the size of the cistern, but never over a foot. It is considered very important to have no cavities whatever in this layer. On the middle part of the bottom is laid a circular stone, hollowed out in the center. On this is erected a hollow cylinder, built of dry bricks, well-laid, those at the bottom being pierced with conical holes. This cylinder comes a little above the level of the soil. The space between the cylinder and the clay walls of the pyramid is filled with washed sand. Before covering the whole with the pavement, there is laid at each angle a sort of stone box, the cover of which, also of stone, is pierced with holes. These boxes are joined with each other by a small canal of dry bricks, resting in the sand. When it rains, the water enters by these boxes, penetrates into the sand through the jointures of the bricks of the canals, and finds its level in the interior of the cylindrical well, having passed through the little holes at the bottom. A cistern so constructed is said to give very pure water, and to retain it perfectly, operating not only as a cistern, but also as a perpetual filter to purify the water.

FACTS ABOUT SEWING MACHINES.

No other class of inventions has attracted so much attention for the past seven years as the sewing machine, and owing to the great success which has attended its general introduction, the public feel a deep interest in all that relates to the history and development of this truly wonderful machine. We shall soon commence the publication of an interesting series of articles on the subject, which will embrace much valuable and interesting information, not accessible to the general reader.

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VOL. III., No. 11....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, SEPTEMBER 8, 1860.

GOOD MECHANISM.

HOSE who engage in the construction of machinery should never allow a poorly-executed article to pass out of their hands, if they desire to establish a permanent business. Many persons commit the egregious mistake of supposing that, if they only make articles or machines cheaper than other parties, and sell them at lower prices—even if the workmanship is of inferior quality—they will be sure to get a large patronage and obtain a permanent custom. They may make large sales for a short period of time, but in the long run they will not obtain a good fixed custom. Not many years ago, a company with quite a large capital commenced the manufacture of rifles on a great scale, in one of our eastern towns; the principal manager conducted the business upon the wrong principle of making cheap and showy articles, irrespective of their quality. In about two years after they had commenced operations, the company was insolvent, and the stockholders lost nearly all their investments. Not many miles from the same place, a few practical mechanics commenced business in the same line and about the same time, with a very small capital; these men, instead of going down, have been going *up* ever since; and to-day they are doing a large, profitable and permanent trade. These mechanics began business with the resolve and the knowledge to do first-class work, and they have therefore succeeded.

Not many weeks ago, we visited the factory of a successful manufacturer of harvesting machines in one of the cities on the Hudson river; and we were informed that the orders far exceeded the capacity of the manufactory to supply them. We had heard good reports of the quality of these mowers from various sections of the country, and the great secret of their good name chiefly consisted in good materials and workmanship. Hundreds of instances of the same import might be collected and adduced to prove that *good* mechanism "fights its own battle, and always comes off victorious."

Our attention has lately been attracted by paragraphs that have appeared in many of our cotemporaries, respecting the machines which have been sent out to the mines at Pike's Peak. H. H. Harris, the owner of several quartz mills at the Gregory diggings, states that there are about fifty mills in operation in that region, "not one of which comes up to the anticipations of its friends." The reasons for this failure he gives as follows:—"Much of the machinery has been manufactured like 'slop-shop' clothing—for sale cheap—and, like that same clothing, it is found *too* cheap when brought into actual service. There is much experimenting with most of the mills, and will be for a year to come. Chilled cast-iron stamps have been sent out; they do not endure like steel ones." Those manufacturers who sent out machines made of inferior materials, and put together in a hasty, bungling manner, have foolishly ruined their reputation in that quarter. As gold quartz mining is a permanent business and extending rapidly, they have thrown away a golden opportunity of establishing a profitable and increasing manufacture of such machinery.

We have known several new and good inventions which had their reputation deeply injured by the miserable mechanism of the first machines brought before the public. Owing to a combination of defective materials and workmanship, the whole broke down in the first public trials, and the merits of the improvements embraced in their combinations and functions were thus wrecked. No inventor should ever bring a new machine before the public until it is so far perfected in all its parts as to do justice to the improvement he has made. If he acts otherwise, he will do the greatest injustice to himself. "Good mechanism" should be engraved upon the heart and conscience of every inventor and manufacturer.

COURTS OF ARBITRATION FOR PATENTEES.

The expenditures of inventors in obtaining American patents are so limited that there is but little, if any, cause for complaint, even in the most tedious and hard-fought cases that are carried through the Patent Office. It is far otherwise, however, when a valuable patent is litigated in the United States courts; in them the expenditures are enormous and the circumlocutions numberless. In these courts contending parties have battled together for years to their mutual injury, and at last learned, from bitter experience, that mutual concessions and friendly arbitration were the best modes of securing justice and peace. We have frequently stated that our laws relating to the trials of patent cases required reforming; but even with such laws, it is in the power of contending parties to obtain the most just and equable settlement of their difficulties by arbitration.

A very important patent case of arbitration was lately tried in London, and it affords us a good example of what would be generally effected if such "courts of conciliation" were made permanent institutions. The plaintiff was M. Wheeler; the defendant, W. Turner; and by mutual consent the reference was made from the Court of Queen's Bench to the decision of two arbitrators, who chose a third as umpire. These were Mr. Wm. Carpmael and Mr. W. E. Newton; the umpire, Mr. T. Spence. The complaint was that Mr. Turner had infringed a patent which had been assigned to Mr. Wheeler, dated Dec. 24, 1851. The specific part of this patent which was claimed to be infringed was the manner of arranging and operating shuttles in looms. The invention consisted in "so constructing and arranging loom battens that two rows of shuttles may be used in such a manner that each fabric can have weft thrown in at the back and front of a middle warp, this middle warp of yarn being stationary. The other warp rises and descends above and below the middle warp to open sheds for the passage of the upper and the lower shuttle. Only one reed is used for each pair of shuttles to move in opposite directions at the same time, the top and bottom sheds of the warp being opened at the same instant. The batten is made with two shuttle races similar to those in common looms where only one row of shuttles is used."

Evidence was adduced by the plaintiff to show that this was a useful invention; while the defendant proved that prior to the plaintiff's patent he had worked several looms in which were shuttles thrown simultaneously through two sheds that were formed by a standing india-rubber warp. Upon examination, however, it appeared that the defendant had thrown his shuttles simultaneously in the same direction, while the plaintiff contended that his invention was the throwing of the two shuttles in opposite directions. The arbitrators were now placed in the same position as our United States Supreme Court in determining the construction to be given to the patent. The defendant contended that the peculiar wording of the specification covered the combination of a standing india-rubber warp with the simultaneous passage of the shuttles through two separate sheds, in whatever direction the shuttles were thrown. The plaintiff, on the other hand, repudiated this construction given to his patent, and maintained that the throwing of the shuttles simultaneously in opposite directions was a main element of the invention.

The award of the arbitrators was to the effect that the plaintiff's patent was good; that it was confined to the use of a standing india-rubber warp, in combination with two shuttles thrown at the same time in opposite directions; also that the defendant had infringed this improvement. The defendant might use a standing warp and throw two shuttles simultaneously in the same but not in a contrary direction.

In this case, the question for decision was narrowed down to a very small difference; and perhaps, if the arbitrators had been less considerate, they would have decided that there was no difference between throwing both shuttles in the same or contrary directions—that these were analagous operations. The arbitrators are men of high respectability in London, being patent agents and attornies; and their profession enabled them to give a more correct and intelligent decision than could have been made by any judge who was merely well versed in law. This is a question which deserves the attention of all our patentees who may have patents in dispute. It is well-known that our United States judges are distinguished for probity and legal acquirements, but they are altogether dependent upon the experts who are hired by the contending parties for their opinions regarding the utility and novelty of the inventions in litigation. By choosing honorable and competent arbitrators (and there are many such in our country) in patent disputes, justice, we believe, would be more quickly and economically secured to patentees than by the common modes of grinding cases through the equity and common law courts.

INGENUITY STILL ACTIVE.

The records of the Patent Office show that, generally throughout the summer months, the number of applications for patents considerably decreases. This year, judging from the amount of business done at our office, and the number of patents issued weekly, we should think the falling-off scarcely perceptible. We find, by reference to our files, that, during the month of August, last year, there issued five lists of patents, four of which contained in the aggregete 331 patents; this year, during the same time, the number has increased to 400, exclusive of designs, extensions and re-issues, thus showing a wonderful spirit of progress and activity among inventors. This progress will appear the more marked when we state that, in 1855, during the month of August, less than 150 patents were issued. While the Examining *corps* of the Patent Office has been generally efficient and active, those connected with the Scientific American Patent Agency have been no less so, as the list of patents published this week fully shows. It numbers 98, of which 45, or almost one-half, were prepared at this office. In fact, our business has so much increased this summer, that we have been obliged to enlarge our force of Examiners. This indicates our rapidly increasing business, and points to the gradual absorption of the entire patent agency business of the United States. We are about to commence the Fall campaign with renewed energy. The members of the firm, with their experienced *corps* of draughtsmen and specification writers, are still to be aided by Hon. JUDGE MASON, who will counsel in all legal matters connected with patents. All business connected with the examination of inventions, preparing specifications, drawings, caveats, assignments of patents, prosecuting rejected cases, interferences, re-issues and extensions of patents, and opinions of the infringement and validity of patents will receive the most careful attention.

COMPLETE SETS OF THIS JOURNAL.—We are asked whether the advertisements, in our paper, of complete sets of the SCIENTIFIC AMERICAN, are by responsible parties, and if it is safe to remit the money. We can only reply that we do not know whether they are responsible or not. Of course, no publisher of a paper can take the trouble to ascertain whether all the statements made by all his advertising patrons are true. If we could answer the query, we should be pleased to do so, but as we cannot, our inquirers must seek the information elsewhere. It is presumed that no person of common sense will remit money to pay for articles in advance to any man, without being first satisfied of his position and character. We may say, however, that, of the first volume of the SCIENTIFIC AMERICAN only a few hundreds were printed, and the number of complete sets now extant are very small indeed. We have tried repeatedly, but without success, to find complete sets for libraries, and we confess to some astonishment when we saw the advertisement of a party in Kansas, proposing to sell several sets at a very low price.

WINDMILLS.—There is a great demand from the South and West for a good windmill. Manufacturers will do well to advertise them in our columns.

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TURBINE WATER WHEELS—ATTENTION.

On another page of the present issue is an illustration of Stevenson's Jonval turbine wheel, which gave the greatest per-centage of power during the experiments conducted at Philadelphia. On page 297 of the last volume of the SCIENTIFIC AMERICAN, we gave the results of those experiments in a clear tabular form; and on page 22 of the present volume we published the report of Chief Engineer Birkenbine on the subject. These experiments have attracted a great deal of attention; every reliable item of information respecting them, therefore, is of value to hydraulic engineers and manufacturers who use water power. In connection with the description of this wheel, a very minute account of the apparatus employed, and the mode of conducting the experiments is also given, so as to present a complete history of the operations.

The builders of turbine water wheels in the United States were officially invited, through the columns of the SCIENTIFIC AMERICAN, on June 4, 1859, by the Chief Engineer of the Water-works, to come to Fairmont and test the comparative value of their different wheels. We inferred—and so did the public—that this invitation conveyed an implied pledge that the wheel which would give the best results in the trial would be adopted by the city of Philadelphia. Such has not been the case. The majority of the Water Committee have instructed the Chief Engineer to enter into a contract with E. Geyelin, of Philadelphia, for two wheels; although, upon the trials, his wheel gave 6½ per cent less power than the one shown in our illustration. A minority of the Water Committee in Philadelphia—namely, W. Neal, Alex. J. Harper and J. D. Enyard—have protested against this treatment of the successful wheel. We have given a plain statement of the case as it now stands, so that the public may have a correct understanding of the whole question and thereby be enabled to form an unbiassed opinion of all the transactions. Mr. Stevenson has removed to the Novelty Works, this city, where he is now building two large turbines.

EXPERIENCE OF INGENIOUS INVENTORS.

MESSRS. MUNN & Co.:—Noticing from time to time, in the columns of the SCIENTIFIC AMERICAN, extracts of letters from parties for whom you have acted as attorneys, complimentary to you, I beg to state my own experience in obtaining patents through your agency, as a testimonial of my appreciation of your ability in preparing patent papers and conducting cases before the Patent Office. Since 1855, I have made, through your office, eight applications for Letters Patent; six have been granted (not one of which was even temporarily rejected) and two are now pending before the Patent Office, on which I expect, an equally good result. These facts you are at liberty to publish for the benefit of inventors who are about to apply for patents, and who are undecided as to whom to employ to do their business. WILLIAM FUZZARD.

Charlestown, Mass., August 25, 1860.

MESSRS. MUNN & Co.:—I was extremely gratified to receive, on the 25th inst., my Letters Patent for a Belt Coupling. I must say that, in my opinion, they are the handsomest looking documents I ever saw; and I cannot refrain from expressing to you my sincere thanks for the manner in which you have conducted the case throughout. CHAS. FAIRFAX, Jr.

Cincinnati, Ohio, August 26, 1860.

MESSRS. MUNN & Co.:—My Letters Patent for an improvement in Beehives (for which an application was made through your agency) came to hand on the 23d inst. I can say I am truly gratified with the result, and with the promptness and efficiency manifested by you in its procurement; and I shall, with pleasure, recommend your agency to all who may desire assistance in obtaining patents, or who may wish for information on that subject. DANIEL ARNDT.

Zanesville, Ohio, August 25, 1860.

STATUES OF EMINENT AMERICAN INVENTORS.—The Commissioner of Patents has given his hearty concurrence in a proposition for the erection of statues to the memory of great American inventors; the expense to be defrayed by private subscription. Niches will probably be prepared in the Patent Office building for the reception of such statues.—*New York Herald.*

LITERARY AND SCIENTIFIC NOTICES.

APPLETON'S CYCLOPÆDIA.

We have received from the publishers—D. Appleton & Co., No. 443 and 445 Broadway, this city—the tenth volume of the "New American Cyclopædia." The number of competent writers in this country is so large that the publishers are able to push through this great work with unexampled rapidity. We gave our opinion of the new cyclopædia so fully on the appearance of the ninth volume, that it is unnecessary to repeat it here. The tenth volume is of the same high character as those which have preceded it. Professor Parsons continues to furnish the law articles, and articles are contributed by Hon. William Kent and Pres. Charles King, LL.D., of Columbia College, New York. In science and the mechanic arts, however, we do not recognize the eminent names that we should be pleased to see among the contributors of this great national work. As a fair specimen of the articles, we extract the following one on litmus:—

"Litmus, a blue coloring substance, obtained from the lichen *rocella tinctoria*, which is collected on the Canary and Cape Verd islands and the coasts of northern Africa, and brought to Holland. The plants, being cleaned from earthy matters, are coarsely powdered and macerated for several weeks, with occasional agitation, in a mixture of urine, lime, carbonate of ammonia, and carbonate of potash. By the reaction of these substances upon the acid properties of the plants, which are themselves without color, their peculiar coloring matters are developed. The mass as it ferments is first red, and then becomes intensely blue. After this change it is mixed with chalk or other earthy substance to give it consistence, and the preparation is completed by molding it into little rectangular cakes. In this state it is the commercial litmus. The cakes are of indigo blue or deep violet color. The coloring matter is extracted by alkalies, partially by water and alcohol. The aqueous infusion is used to prepare the slips of litmus paper, which are employed by chemists as a test of acids and alkalies. Unsized paper is either dipped into the liquid, or this is brushed over its surface; and when the paper has been dried it is carefully preserved in well stopped vials. A bit of it moistened and exposed to acid vapors, or to any liquid having the slightest acid reaction, is immediately changed from blue to red; and thus changed, it becomes a test of alkalies, the effect of which is to restore its former color. It differs from most other vegetable blues, which, by the reaction of alkalies, are generally rendered green.'

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

ROLLING BLANKS FOR GOLD PENS.

In rolling blanks for the manufacture of gold pens, one pair of rolls only have heretofore been employed, and the blanks have necessarily been subjected to successive pressures by adjusting one pair of rolls. In the rolling-out and attenuating of the blanks, great precision and exactness are required in order to produce perfect work; and the use of only one pair of rolls involves the necessity of various adjustments which lead to inaccuracies of workmanship, and a general lack of uniformity in the production of the work. In addition to this, the employment of only one set of rolls precludes the obtaining of a differential pressure, that is to say, the gradual and successive varying of the belt of the rolls from the diamond or point of the blank, in order to obtain a gradual taper or attenuation from point to back, as may be required. The object of this invention is to obviate these difficulties, expedite the rolling process, produce perfect work with unskilled labor, and at the same time economize in stock. The invention consists in the use of a train of rolls, so arranged as to be capable of rolling out or attenuating the blanks by a series of consecutive operations without changing the set of the rolls. The invention also consists in a novel way of connecting the axes of said rolls to compensate for any imperfections in the driving gear, and also in a peculiar relative formation of the eccentric rolls one with an other to obtain a differential pressure. The invention further consists in the use of guide rests for the purpose of insuring the proper presentation of the blanks to the bite of the rolls, and keeping them at right angles to the rolls while passing through or between them. The credit of this contrivance is due to Alexander Morton, of this city.

TERRESTRIAL TIME GLOBE.

The object of this invention is to illustrate the position of our globe in relation to the sun, and all its varitions, during the 24 hours of a day, and during the course of a year, and this object is obtained in a simple and ingenious manner by the combination with a clock movement of a terrestrial globe which revolves once in 24 hours, on an axis placed at an angle of 66½ degrees towards the horizon, which latter represents the plane of the earth's orbit, and from which rises a vertical bow encircling the globe, and made to represent the spheres of light and shade, or day and night, on the revolving globe in such a manner, that the time of the day, the length of the days, and the time when the sun rises and sets in any place on the globe, can be determined at a glance. F. S. Barnard, of this city, is the inventor.

FEEDING SAWDUST TO FURNACES.

The object of this invention is to obtain a device for feeding sawdust to the furnace direct from the saw, and to distribute the sawdust in the furnace in the most favorable way to insure a perfect combustion of the former. The invention is designed to be applied to the furnaces of the boilers of steam saw-mills and to afford an automatic feeding device which will cause the sawdust to be consumed as fast as it is produced during the sawing operation. The invention consists in the use of a reciprocating plunger fitted within a cylinder which communicates with a box containing a rotary scatterer, the box in communication with the furnace, and all arranged to affect the desired end. The inventor of this improvement is Samuel Kennedy, of Hibbets, Ohio.

REGISTER FOR STREET CARS.

This invention consists in combining with a style gate, placed on the platform of a car, and surrounded by a suitable railing so that an entrance or exit can only be affected through the gate, a set of strikers which act on a spring bar, so constructed to contain wheel work pawls, stops, &c., that each passenger entering the car will be registered by an index hand, the registering apparatus being so arranged that the gates will operate the registering apparatus only once for each passenger, either in entering or leaving the car. This improvement was designed by Lewis H. French, of Philadelphia, Pa.

AXLE-BOX.

This invention has for its object the prevention of lateral motion of the car body on its axles, in order to avoid the wear and tear of the steps or bearings of the axle and the box, and concussions attending the same. The invention also has for its object the perfect lubrication of the journals without affording an opportunity for the oil or lubricating material to escape from the box, and also in a peculiar means to prevent the ingress of mud or dust within the box. The invention is designed more especially for city railroad cars, for which none of the improved or patented boxes have been especially designed, and which have been adapted by certain modifications to answer rather imperfectly. This device has been patened to Montgomery Queen, of Brooklyn, N. Y.

HAMMER.

Reinhold Boeklen, of Brooklyn, N. Y., has just obtained a patent for an exceedingly ingenious and very useful invention, which consists in so magnetizing or applying magnetism in connection with a hammer, that it shall be capable of picking up tacks or nails and enabling them, when so picked up, to be knocked into wood or other material, without the necessity of handling them; thereby affording great convenience for the application of tacks or nails in laying down carpets or in upholstery, joinery or other kinds of work. These valuable hammers will be manufactured by Messrs. Bennett & Boeklen, at the Harlem Railroad Freight Depot, in Center-street, this city.

SEWING MACHINE.

This invention consists in a certain construction of the bed or work-table of a sewing machine, whereby it is adapted to do certain kinds of work which cannot be conveniently done by the machines previously constructed, more especially to the sewing of those parts of boots and shoes, and other articles of stiff material, in the performance of which it is desirable that a portion of the article should hang over the bed on one or more sides of the needle. The patentee of this invention is David Haskell, of Georgetown, Mass.

SINECAL QUADRANT.

This is a very ingenious instrument by which all arithmetical calculations may be made, and all problems in plane and spherical trigonometry may be solved. It is especially useful in navigation and land surveying. The credit of this invention is due to A. M. Chisholm, of Antigonish, N. S.

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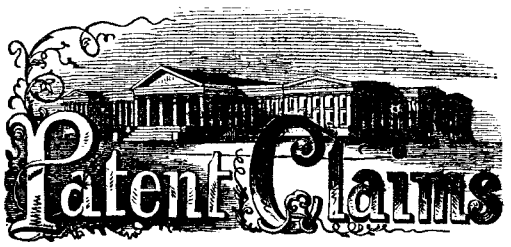

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING AUGUST 28, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,751.—W. H. Allen, of Brooklyn, N. Y., for an Improvement in Elevators for Store-houses:

I claim the arrangement and combination of the two double-threaded screw shafts, D D, sliding blocks, c c, bars, B, platform, C, and guide frame, A, with the jointed levers, J J′, as and for the purposes set forth and described.

[This invention consists in the employment of extension levers or joints, with right-and-left screws for distending or contracting the joints, which levers act upon the hoisting car, and move it up and down in grooves in guide timbers that extend perpendicularly from the bottom to the top of the building, the whole being arranged in such a manner that by turning the right-and-left screw shaft the platform may be elevated or depressed with a very little expense of power or loss of time.]

29,752.—James Alsop, of Clinton, Ill., for an Improvement in Seeding Machines:

I claim, first, The arrangement of the wheels, S′ U, with the tubes X, and boxes, V, provided with the valves, q, and actuated through through the medium of the arms, r, levers, t, weighted arm, Y, and the pins, w, on the wheels, U, as and for the purpose set forth.

Second, In combination with the wheels, S′ U, and boxes, V, the cylinder, S, and hopper, R, when arranged as shown, to admit of the sowing of the seed either in hills or drills or broad-cast, as may be desired.

[This invention relates to certain improvements in that class of seeding machines which are designed for general use—that is to say, for planting various kinds of seeds, and either in hills or drills or broadcast, as may be required. The invention consists in a novel seed-distributing arrangement, and also in a peculiar arrangement of means for regulating the depth of the plows, whereby a very efficient implement is obtained for the desired purpose.]

29,753.—E. S. Bacon, of Albion, N. Y., for an Improvement in Beehives:

I claim a beehive constructed of cylindrical form, when provided with comb frames, E, constructed substantially as shown, to conform to the interior of the hive, for the purpose specified.

I further claim the flanches, a, when grooved at their under sides and attached to the base, C, as and for the purpose specified.

[The object of this invention is to obtain a hive that will admit of the bees remaining in a compact state within the hive, and still have access to all parts thereof, without materially spreading themselves or becoming detached from a general mass.]

29,754.—Edward Badlam, of Ogdensburgh, N. Y., for an Improvement in Seeding Machines:

I claim the combination and arrangement of harrow teeth, operating as described, with the shaking seed hopper, G, all receiving their motion from the two driving wheels, A′ A′, as used for the purposes set forth.

[This invention consists in arranging in a suitable frame, mounted at its rear end on driving wheels, between which may be placed a large cylinder that serves for a roller, a number of rockshafts parallel to each other, which shafts carry the harrow teeth that receive a transverse rocking motion as the machine is drawn along from the driving wheel as will be hereinafter described; and in conjunction with such a harrow it consists in the employment of a long seed box or hopper arranged either in front, in the middle, or in the rear of the harrow, and operated with a transverse shaking motion for equitably scattering the seed, while the rocking teeth harrow them in or prepare the soil for their reception.]

29,755.—F. S. Barnard, of New York City, for an Improved Automatic Terrestrial Time Globe:

I claim, first, The arrangement in combination with the clock movement, D, of a revolving terrestrial globe, A, on an inclined axle, C, and encircled by a bow, F, constructed and operating substantially as and for the purpose set forth.

Second, The arrangement of the indicator, H, in combination with the revolving globe, A, and with the bow, F, constructed and operating substantially in the manner and for the purpose specified.

Third, The arrangement of the fixed hand or pointer, J, on the toothed ring, G, in combination with the rotary rings, L and M, or their equivalents, constructed and operating substantially as and for the purpose set forth.

29,756.—H. M. Bearce, of North Auburn, and L. C. Peck, of Lewiston, Me., for an Improved Machine for Cutting and Swaging Shoe Tips:

We claim the die, I, constructed in the manner described, and in combination with plunger, K, operated by cam, L, gravity or adjustable percussive force, or both, the latter being imparted to the plunger by screw, E, and helical spring, Q, or otherwise, for swaging the tip, essentially in the manner and for the purposes fully set forth.

We also claim the cutter, J2, stamp, K2, and die, N2, constructed and arranged as described, for cutting the blank, when combined with die, I, for swaging the tip, essentially as set forth.

We also claim the combination of the tube, P2, stand Q2, and slide bar, R2, operated by cam or otherwise, to receive and feed the blanks direct from the cutting die to the swaging die, essentially as set forth.

We also claim the rod, R, and its plate, T, guide plate, S, and helical spring, U, combined with die, I, the rod, R, being operated by percussive force to throw the swaged tip from the die, essentially in the manner and for the purposes fully set forth.

29,757.—David Bissell, of Detroit, Mich., for an Improvement in Crimping Machines:

I claim the supplemental jaws, E E, with their lugs, as described, in combination with the jaws, B B, levers, G G, and treadle, H, arranged, combined, and operating in the manner set forth.

[This invention consists in a novel manner of applying lateral pressure to the jaws, and at the same time stretching the leather tightly at the instep portion. It further consists in putting the clamping boards or jaws together in such a manner that they will admit of lateral adjustment, and at the same time yield to the inequalities in the thickness of the leather front during the operation of crimping.]

29,758.—Thomas Black, of Princeville, Ill., for an Improvement in Cultivators:

I claim the arrangement of the elastic traverse bow bar, C, adjustable rods, c, bow bar B, beams, A A, double trees, K, chain, I, pulleys, H J J, beam, A, guards, G G, standards, E, and shares, D F, all as shown and described for the purpose set forth.

[The object of this invention is to obtain a cultivator that may be used for plowing or operating among plants of various hights without injuring the same, due provision being made against the breaking down of large plants by the passing along of the implement, and suitable protection being afforded small plants against stones, clods, &c., which may be cast towards them by the action of the shares. The invention also has for its object the equalizing of the draught, so as to insure equal pull on each beam of the implement, and a perfect operation of the same.]

29,759.—Thomas Board, of Ripley, Va., for an Improved Shoe-cleaner:

I claim the arrangement of the rising and falling slide, C, in combination with the side jaws, B B, constructed and operating substantially as and for the purpose set forth.

[This invention consists in arranging a rising and falling slides in combination with two spring side jaws in a suitable frame fastened to the doorstep or to any other convenient place, in such a manner that if a boot or shoe is placed between the spring jaws and the vertical slide is depressed on the instep, and the foot is now drawn backwards, the mud adhering to the boot or shoe is cleaned off on the top as well as on the sides.]

29,760.—Reinhold Boeklen, of Brooklyn, N. Y., for an Improvement in Hammers:

I claim, first, So magnetizing or applying magnetism in connection with a hammer that it may be capable of picking up tacks or nails, and inserting them in wood or other material, substantially as described.

Second, Coating the whole head of the hammer, so magnetized or rendered magnetic, with the exception of the face and opposite end, with poorly conducting material, substantially as and for the purpose specified.

29,761.—L. Bradley, of New York City, for an Improvement in Telegraphic Apparatuses:

I claim, first, The combination of a helix with a core arranged to pass through its center and around and in close proximity to its surface, with the poles also in near proximity to each other, for the purpose set forth.

Second, The combination of a magnet constructed substantially as described with a keeper arranged parallel to the legs of the magnet, and in close proximity to the periphery of the helix for the purpose set forth.

Third, The combination of the armature, or its equivalent, for breaking and closing the circuit, with two springs arranged to act on each other in opposite directions for the purpose set forth.

Fourth, The combination of a sectional helix with a double switch, arranged substantially as described for the purpose set forth.

Fifth, The combination of a vibrating armature, or its equivalent, in closing and breaking circuits with a sounding-board and tension wires, arranged substantially as described for the purpose set forth.

Sixth, The combination of an electro-magnet with an armature suspended by its center between the poles of the magnet, so as to come in contact with both poles at the same time.

29,762.—G. W. Brown, of Galesburg, Ill., for an Improvement in Cultivators:

I claim, first, So combining the frame wheels and plows with the levers, L M, as that the driver or operator, from his seat may turn or cramp said frame, wheels, and plows on the tongue, to cause the plows to follow the crooks in the rows of plants, substantially as described.

I also claim so combining the seat and tongue with the frame and with an axle set in advance of its supports in the wheels, as that the driver or operator in his seat, by shifting his weight, may raise, hold up, and lower the plows, substantially as described.

I also claim, in combination with the plows, the convex cutters or shields, N N, when constructed, arranged and operating as set forth.

29,763,—T. S. Brown, of Philadelphia, Pa., for an Improved Oscillating Ships' Berth:

I claim, first, The arrangement of a rockshaft, D, crossbars, E, and suspension rods, H, in combination with a boat berth, for the purpose of neutralizing the motion of a ship, substantially as set forth.

Second, The arrangement of hinged boards, 3 4 1 2 U L L, corks, 9 10 11 12, and air-tight tubes, J, forming a berth and lifeboat, substantially as set forth.

29,764.—George Buchanan, of Hickory, Pa., for an Improvement in Self-acting Wagon Brakes:

I claim the arrangement of the brake, e, bar, g, rods, x and m, strap, Y, springs, q and v, and cords or chains, d, when used in combination with cars, wagons and carriages, the whole being arranged, combined, constructed and operated as described and for the purpose set forth.

29,765.—A. H. Burdine, of Chulahoma, Miss., for an Improvement in Cotton Gins:

I claim cutting away a part of the upper portion of the breast of a cotton saw gin, in the manner and for the purpose described, so that there shall be a horizontal opening across the breast the full width of the saws and of less depth than the size of a cotton seed, and so that the teeth of the saws shall extend a short distance beyond the upper end of the ribs of the breast and into the horizontal opening, substantially as and for the purposes described.

28,766.—L. S. Chichester, of New York City, for an Improved Meat and Vegetable-chopper:

I claim the combination of the bowl, A, of circular or semi-circular form, and the radius knife frame, D, so applied as to admit of a rising and falling movement and also a lateral one, as and for the purpose set forth.

I further claim, in combination with the bowl, A, and knife frame, D, the plate, C, applied to the bowl, and arranged relatively with the knife frame, D, to operate as and for the purpose set forth.

[The object of this invention is to obtain a simple, efficient and economical implement for the purpose of chopping meat and vegetables in a small way for family use; the device being intended for the kitchen, to occupy but little space, and to require but little labor to manipulate it.]

29,767.—A. M. Chisholm, of Antigonish, Nova Scotia, for an Improvement in Sinecal Quadrants:

I claim a mathematical mechanical scale, composed of the graduated plane square, A B C D E, divided and sub-divided into less squares of tenths each way, and having a graduated quadrant, E, in one of the four corners, the radius of which quadrant extends to 60 of the sub-divisions or sixteenths of the sides of the square, and also provided with an index, F, marked as described, and pivoted to the square in the vertex of the angle, agreeing with the quadrant and otherwise made as shown and described.

29,768.—Theodore Christian, of New York City, for an Improved Rotary Cutter Head for Planing Machines:

I claim, first, The combination of a rotary cutter and planing iron with an adjusting screw and nut, arranged to pass through the iron, substantially as described, whereby the cutters may be drawn out or thrown in as required to adjust them to each other.

Second, The combination of a rotary cutter head, a planing iron and a clamping iron, arranged as described, to hold the iron to the head and prevents its springing.

Third, The combination of a series of cutter heads and a series of cutters, constructed and arranged on one shaft, substantially as described, so as to abut and form a continuous line of cutters; and also so that the position of the heads and cutters may be changed in relation to each other on the shaft, in order to produce a great variety of perfect compound moldings with a few varieties of cutters.

Fourth, The combination of a cutter head with a cruciform dividing saw arranged on the same shaft, so that it can be turned and the position of its arms, in relation to the cutter knives, changed as required, for the purpose as set forth.

29,769.—Edward Conway, of Dayton, Ohio, for an Improvement in Heating and Cooking Apparatuses:

I claim, first, The arrangement of valved compound burners, C E e, in the described combination, with a cooking stove, A, for the purposes set forth.

Second, The compound burner composed of a wick, t, and circular series of jets, u, communicating with the alcohol boiler, as set forth.

29,770.—Arthur de Witzleben, of Washington, D. C., for an Improvement in Holding Doors Open:

I claim the box, A, apartment, B, shank, C, knob, D, spiral spring, E, bottom, H, feet, m m, and plate, n, when used for the purposes specified.

20,771.—J. C. Dickey, of Saratoga Springs, N. Y., for an Improved Gold-washer and Amalgamator:

I claim the projections, c, made on the base and under-side of the revolving cone, E, working in one or more channels made on the base of the stationary cone, D, for the purposes set forth.

29,772.—T. S. Disston and Henry Disston, of Philadelphia, Pa., for an Improved Machine for Setting Saw Teeth:

We claim, first, Causing the saw blade to traverse over the anvil by means of the rotating cog-wheels, S and S′, the same being rendered adjustable in respect to the platform, P, by the devices described, or by any other equivalent mechanism, for the purpose specified.

Second, We claim, in combination with the said conical cog-wheels, two or more hammers moving simultaneously, and being so arranged and furnished with such adjusting appliances that the heads of the hammer may be adjusted in respect to each other and to the said conical cog-wheels, as and for the purpose set forth.

Third, We claim the platform, P, secured to the permanent frame and rendered adjustable thereon, substantially in the manner and for the purpose set forth.

Fourth, The guide plates, p and p′, arranged in respect to the platform, P, and rendered adjustable in respect to the conical cog-wheels, substantially as set forth, for the purpose specified.

Fifth, The combination of the adjustable anvil with the conical cog-wheels and the hammer.

29,773.—H. T. Douglas, of Zanesville, Ohio, for an Improvement in Sugar Cane Mills:

I claim, first, Constructing on the top and bottom plates of a sugar mill V-shaped inclined planes which come between the rollers and prevent the cane from working between the ends of the rollers and the plates and thereby obstructing the working of the mill, substantially as set forth.

Second, The combination in a sugar mill of the inclined projections, r r, elliptical boxes, g, with shoulders, l, and the feed plate, S, the whole constructed, arranged and operating substantially as described for the purposes set forth.

29,774.—D. E. Fenn, of Tallmadge, Ohio, for an Improved Gate:

I claim the arrangement of the inclined planes, H L, extending across the open space between the posts of the frame, A A′, the gate, C, posts, K, rod, J, arms, G, and ropes, M N, as shown and described, so that the front end of the gate will rise and fall upon the inclined planes, H L, while the rear end of the gate will ride upon the horizontal rod, I, and so that by pulling upon either of the ropes the gate will be opened or closed, being moved partly by the force applied and partly by its own gravity in descending the inclined planes—all as specified.

29,775.—Frederick Fidler, of Batavia, N. Y., for an Improvement in Stalk and Root-cutters:

I claim, first, In connection with the knives, E E, the scorers, G, for the purpose specified.

Second, The serrated, reciprocating plates, I I, operated through the medium of the treadle, H, link, j, lever, J, and arms, K K, for the purpose of feeding the substance to be cut to the cutters.

[This invention relates to a certain improvement in that class of stalk and root-cutting machines in which knives are attached to the side of a wheel. The invention consists, 1st. In a peculiar shape or form of the knives, by which a regular or even cut is obtained. 2d. In a novel way of adjusting the knives. 3d. In the use of scorers in connection with the knives. 4th. In a novel feeding device—the whole being so constructed and arranged as to form a simple, efficient and easy-working machine for the intended purpose.]

29,776.—J. F. Finger, of Marion, S. C., for an Improved Circular Table:

I claim a circular pedestal table furnished with a rod, G, step bearing, G′, and foot levers, E E E E, and otherwise constructed in the manner and for the purposes set forth.

[This invention consists in hanging a circular top table, having drawers in it, in such a manner that the top will be firm and steady under ordinary circumstances, and whenever desired it may, by placing the foot on certain levers, be rotated on its pedestal.]

29,777.—F. G. Floyd and E. A. Floyd, of Macomb, Ill., for an Improvement in Corn Planters:

We claim the combination with a seed-planting frame constructed as described of the seed slide, a, vibrating arm, c, receiving its motion from arm, d, the wheels, g g′, and shaft, h′, arranged in the manner and for the purpose set forth.

[This invention is an improved corn planter for opening the furrow, dropping the corn and covering two rows at the same operation. The machine is provided with adjustable plows or shoes which open the furrows, for regulating the depth required to plant, that are controlled by the driver. The invention provides for carrying in the hopper a large supply of seed, which may be let into the dropping boxes in small supplies, regulated according to the quantity to be deposited at each movement of the seed slide, thus preventing the seed apertures or the boxes from choking up in consequence of the great body and, necessarily, weight of seed. Provision is made for turning the machine and for starting or stopping the motions of the dropping device at the option of the driver.]

29,778.—L. H. French, of Philadelphia, Pa., for an Improved Car Register:

I claim the combination with the turn-stile arranged substantially as set forth, of the strikers, a, spring bar, H, slotted arm, I, pawl bar, G′, with its spring pawl, c, and ratchet wheel, G, combined with a suitable registering apparatus, and arranged and operating in the manner and for the purposes set forth.

29,779.—Ransom Gilbert, of Morrisville, Vt., for an Improved Clothes-dryer:

I claim the arrangement of the india-rubber straps, D D, and pins, f f, with the hubs, H H′, and standard, arms, braces and cords, as and for the purpose set forth.

29,780.—John Goulding, of North Wilbraham, Mass., for an Improvement in Cotton Gins:

I claim, first, The concave or apron, O, in connection with the toothed plates, L, and wheel, C—said parts being constructed as shown for the purpose described.

Second, The combination of the toothed plates, L, comb wheel, C, concave or apron, O, stripper, F, and beater wheel, H—said parts being constructed as shown for the purpose set forth.

[The object of this invention is to obtain a machine by which cotton may be ginned or separated from its seed; the machine per-

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forms its work in the most efficient manner without injuring the fiber of either the cotton or wool, bnt leaving the same in a loose, light state most favorable for subsequent manufacture.]

29,781.—C. A. Gregory, of Poughkeepsie, N. Y., for an Improved Apparatus for Filling Bottles:

I claim a machine for filling bottles and other vessels, constructed and operating substantially in the manner described, whereby any required number of vessls may simultaneously receive a measured quantity of liquid from a reservoir with rapidity, precision and safety, as set forth.

29,782.—Stuart Gwynn, of New York City, for an Improvement in Spading Machines:

I claim, first, The employment, in combination with the spades and for operating them, of double cranks arranged to move in reverse directions and giving a compound action to the spade or spades essentially as specified.

Second, Providing the spade stock or holder with a spring stop or stops so constructed and arranged as to be capable of being thrust away or to o e side of the spade in its descent or digging stroke to avoid striking a stone or other in ervening obstacle calculated to injure it, and permitting of the yield or rise of the spade therefrom substantially as shown and described.

Third, Constructing and arranging the spade stock or holder as shown and described, with a twist screw or helical groove, or the equivalent thereof, so that the spade, in its reciprocating or longitudinal travel, shall, at a certain point or points thereof, be turned and made to assume different positions relatively to the line of cut, essentially as set forth.

Fourth, Causing the spade, after it has been pushed into its stock or holder by meeting with an obstacle in its descent, to be automatically returned to its proper position for further work, during the retreat of the holder, by means of the same device or pin which, in connection with the helical slot in the stock, serves to turn and alter the position of the blade of the spade relatively to the line of cut, essentially as described.

Fifth, Constructing the spade or spade blade with an articulation joint for action when in the soil or when freeing itself therefrom, and during the backward thrust or throw of the spade, to avoid injury or breakage from stones or other like obstacles in the soil.

29,783.—L. W. Harris, of Waterville, N. Y., for an Improvement in Presses:

I claim the employment of the open follower bars, l l, in combination with the hinged rack, C C, attached to the bed as shown and described, so that the said racks will serve as guides to the follower, and so that they can be readily turned down to a horizontal positon away from the press when not required for operation, all as set forth.

Also, The combination of the pawls, m n, when connected by jointed arms, o, with cylinder, e', hinged rack, C, and open follower bars, l l, as shown and described, so that one of said pawls will be operated at each movement of either of the levers, E, and so that that the cylinders, e', may be removed together with the pawls and levers, E, whenever desired, as set forth.

Also, The arrangement of the axes of the pawls, m n, within the circumference of the hollow cylinders, e', as and for the purpose shown and described.

[The object of this invention is to obtain a simple, efficient, and rapidly-working press for manual operation—one that will admit of a very ready application of power and may have the substance to be pressed readily placed into the press box and removed therefrom with facility when compressed into bale form. The invention is more particularly designed for compressing hops, but it may be used for compressing hay, cotton or other substances which are generally compressed for baling.]

29,784.—James Harrison, of Troy, N. Y., for an Improved Apparatus for Ringing Bells:

I claim distributing the blows of the hammer or clapper of a bell along or around the sound bow or circumference of the bell, substantially as described, by urning the bell or its clapper or hammer by the action of the bell-ringing mechanism in sounding the bell, substantially as described.

29,785.—David Haskell, of Georgetown, Mass., for an Improvement in Sewing Machines:

I claim the arrangement of the isolated, upright post, C, with the notched, movable plate, F, in the manner and for the purpose shown and described.

29,786.—Simeon Heywood, of Claremont, N. H., for an Improvement in Operating Railroad Switches:

I claim the combination of a pivoted, slotted knee or tumbler with a traversing bar and stud, for the purpose of operating the switches of railroads substantially as described.

29,787.—P. B. Holmes, of Cincinnati, Ohio, for an Improvement in Rotary Engines:

I claim the described combination of collars, H, heads, K, and packing chambers, I, constructed, arranged and operating in connection with the packing, d d' d'', in the manner and for the purpose explained.

29,788.—C. B. Horton, of Elmira, N.Y., for an Improvement in Machines for Hulling and Polishing Rice:

I claim, first, Constructing the concaves of hulling machines of flexible steel plates having a flexible lining, constructed as described in combination with elastic springs, in the manner and for the purpose specified.

Second, The combination of the hopper, b, cylinder, B, and screen, C, or its equivalent, when so constructed and arranged in relation to each other that the motion of the cylinder shall cause a circulation of the grains in the manner and for the purpose set forth.

29,789.—E. S. Huff, of Zanesville, Ohio, for an Improvement in Cultivators:

I claim the combination of the segmental arcs, e e', plow beams, b c c', and pivoted cross-beams, h h', substantially in the manner and for the purposes set forth.

29,790.—George Hull, of Port Crane, N. Y., for an Improvement in Cattle Ties:

I claim imbedding the spring, a, in the body of the snap by forming the latter with side guards, b b, constrncted and arranged substantially as shown and described.

Also, Constructing the clasp body of curvilinear or other equivalent form in direction of its length, and providing its interior with spiral rooves or ribs, f, substantially as set forth.

29,791.—Solomon Hunt, of Danville, Ind., for an Improved Washing Machine:

I claim the arrangement of the tension roller, G, weight, I, and rollers, b b, with the endless belts, E K, and drums, D D' and J J, whereby one weight answers for producing friction or tension on all the belts and upon the clothes, as set forth.

[This invention consists in a novel arrangement of pressing rollers and endless aprons that are arranged within a suitable box and acted upon by a weight, so that the articles to be subjected to the washing operation will be alternately passed down into the water contained in the box or tub and subjected to a pressure which will have the effect of cleaning them with great rapidity.]

29,792.—G. K. Hyde, of Brooklyn, N. Y., for an Improvement in Operating Railroad Switches

I claim the combination of the slotted cylinder, H, treadle, j, rod, g, spring, h, with the laterally-moving slide, G, lever, e, and truck, A, as and for the purpose shown and described.

[This invention is designed for city and other railroads on which the cars are drawn by animals. The object of the invention is to place the operating of the switches under the complete control of the driver, thereby dispensing with the services of switch-tenders and the trouble and embarassment attending the negligence of the same.]

29,793.—W. A. Ives, of New Haven, Conn., for an Improved Auger:

I claim the combination of the double twist with two cutting horizontal or floor lips with side cutters, a a, attached to one of said floor lips only, in the manner and for the purpose substantially as specified.

29,794.—Samuel Kennedy, of Hibbetts, Ohio, for an Improved Apparatus for Feeding Sawdust to Furnaces:

I claim the combination of the stepped plunger, B, cylinder, A, and hopper, f, with the box, D, scatterer, D', and shaft, C E, as and for the purpose shown and described.

I also claim the arrangement of the bearing of the lower end of shaft, E, within a stirrup, L, below the box, D, and upon a screw, J, which also connects the stirrup and the frame, K, together—all as set forth, for the purpose specified.

29,795.—G. S. Kinsey, of Reading, Pa., for an Improvement in Horse Rakes:

I claim, first, The stationary mortised cleaners, 4 4, when used for the double purpose as cleaners and tooth gnides, as described and set forth.

Second, The combination and arrangement of the hand lever, h, spring latch, 6, semi-circular, slotted rack, e, and connecting bar, 8, when constructed and operated as and for the purpose specified.

29,796.—W. M. Knight, of Buffalo, N. Y., for an Improved Sad-iron:

I claim the jointed leg, B', and the slotted, locking, handle portion, G, with the recesses, a a, in the body of the iron, arranged substantially as and for the purposes described, represented and specified.

[This invention and improvement consists in jointing ne of the legs to the horizontal or holding part of the handle, and in operating this jointed leg by a supplemental rotating handle having a ferule on its end, with an oblique slot cut in it in such a manner that the ends of the legs will be distended or made to approach each other, and locked in recesses formed in the "flats," or detached from the flats at pleasure.]

29,797.—E. D. Lady, of Nashville, Tenn., for an Improvement in Straw-cutters:

I claim the perpendicular feeding box, D, with its doors, F, pin, X, standard, E, and tongue, e, for the purpose described or any substantially the same, as set forth.

29,798.—R. Little, of Middle Branch, Ohio, for an Improved Coffee-roaster:

I claim the combination with the oval and divided shell, A, of the series of endless, reversed, inclined ribs, e e, arranged and operating as shown and described.

29,799.—Samuel Maitland, of Fort Wayne, Ind., for an Improvement in Beehives:

I claim, first, The swarming pole, G, provided with the ball or hub, H, and attached to the hive for the purpose specified.

Second, The queen cells, h', attached to the hive substantially as and for the purpose set forth.

Third, The feed drawer, D, fitted within the box, C, on which the main portion, A, of the hive rests, and is made to communicate with the part, A, when desired, by the slide, E, substantially as described.

[This invention relates to means employed for facilitating the swarming of bees and the dividing of swarms, and also the proper feeding of the mother colony when necessary. The invention consists in the use of a swarming pole, queen-bee cells, and feed box, whereby the desired end is attained.]

29,800.—F. H. Manny, of Rockford, Ill., for an Improvement in Harvesters:

I claim the arrangement of the hinged cap or bonnet, D, and shoe, C, in relation to each other and to the mechanism operating the cutter of the harvester, substantially as and for the purpose described.

29,801.—M. H. Mansfield, of Ashland, Ohio, for an Improvement in Seeding Machines:

I claim the described special arrangement of the teeth and deflectors, G, when these latter are composed of an elactic substance and operating substantially as set forth.

29,802.—Elisha Matteson, of Brooklyn, N. Y., for an Improvement in Converting Reciprocating into Rotary Motion:

I claim, first, The reciprocating ratchets, G and H, in combination with the ratchet wheel, E, when the same shall be arranged in conjunction with and operated by the lever, B, and cam guides, I and J, or by means substantially the same and for the purpose specified.

Second, In combination with the same, I claim the lever, M, pawl, L, rod, N, and pins, j f k, for the purpose set forth.

Third, In combination with the ratchets, G and H, and ratchet wheel, E, I claim the friction wheel, O, handle, P, and spring, Q, arranged and operated for the purpose described.

29,803.—James McLaughlin, of Duncannon, Pa., for an Improvement in Seed Planters:

I claim, first, The arrangement of a seed-dropping and distributing plug-valve, L, with a vertical sliding frame, F F, and cams, E, substantially as and for the purposes set forth.

Second, The arrangement of slotted standards, N and R R, of the furrow-opener, M, and coverers, D', in combination with a lever, P, rod, Q, and latch, S, substantially as and for the purposes set forth.

Third, The arrangement of double ratchet wheels, V W, upon the shaft of the driving-wheels, in combination with pawls, T X, cross bar, Y, and lever, Z, substantially as and for the purposes set forth.

29,804.—M. D. Meriwether, of Denmark, Tenn., for an Improvement in Harrows:

I claim, in combination with a slotted transverse arched beam, A, two or more adjustable harrows and harrow-blocks, when constructed and arranged substantially in the manner and for the purpose described.

29,805.—John Middleton, of New York City, for an Improved Window-washer:

I claim the window-washer described, as a new article of manufacture, the same consisting of a brush, B, a reservoir of changeable capacity, C, on or near the same level as B, the opening, D, between C and the front of B, and the rod, G, or its equivalent, whereby C is made to change its capacity, substantially as and for the purposes set forth.

29,806.—W. H. H. Miller, of Williamsport, Pa., for an Improvement in Railroad Car Couplings:

I claim the employment of hooked levers, D H D H, centered at K K, and the connecting links, E E, between them on the truck, and the adjustable knee, I I, on the body of the car, arranged to operate together substantially as described.

29,807.—J. R. Mills, of Bloomfield, Iowa, for an Improvement in Seed Planters:

I claim the relative arrangement of a detachable hopper, D, slides, G and N, seed distributor, I, square shaft, B, and lever, L L', constructed in the manner and for the purposes set forth.

29,808.—G. R. Moore, of Pittsburgh, Pa., for an Improved Gage for Double-seaming Machines:

I claim the rotary disk, r, face of the gage, m; also, the adjustable arbor, i, or any other equivalents.

29,809.—Alex'r Morton, of New York City, for an Improved Machine for Rolling Gold Pens:

I claim, first, The connecting of the axes of the rolls, C D, by means of the couplings, f, when said rolls are arranged substantially as and for the purpose specified.

Second, The forming of the eccentric portions, b, on the lower rolls, D, in such a way or in such positions, relatively with each other, that the bite of the rolls may act consecutively at different points on the blanks and produce the differential pressure, as set forth.

Third, In connection with the train of rolls, C D, the guides or rests, E, placed relatively with the rolls, as and for the purpose specified.

29,810.—H. G. Nelson, of Lockport, N. Y., for an Improvement in Water Wheels:

I claim the arrangement of the gates, I I, shafts, H H, and sectors, J J, with the shaft, D, vent, C, and case, A: all as shown and described, for the purpose set forth.

[This invention consists in a novel and improved manner of constructing the wheel, whereby a very cheap, simple and durable wheel, with oblique or tangential buckets, is obtained. The invention also consists in an improved gate, arranged and applied to the scroll so as to regulate the discharge of the water therefrom, and its consequent action on the wheel.]

29,811.—J. L. Newton, of Black Brook, N. Y. for an Improved Quilting Frame:

I claim the combination with standards, A A, of the quilting frame, composed of bars, B B and B' B', with their rollers, E E and F and G G and H, furnished with straps and hooks and ratchets and pawls, and otherwise constructed and keyed to the standards, A A, as and for the purposes set forth.

[The object of this invention is to construct a quilting frame that may be extended or contracted, to adapt it to quilts of different sizes, and which may be closed up so as to occupy very little space. The invention consists in jointing the arms and bars to which the quilt is attached to the top of two upright standards, in such a manner that the frame may be folded-up—or, rather, placed in a perpendicular state—when not in immediate use, and so that it may be locked rigidly in a horizontal state; and it consists in furnishing the quilting frame with rollers and adjustable arms, arranged and combined in such a manner that they may be extended or contracted longitudinally.]

29,812.—N. A. Patterson, of Kingston, Tenn., for an Improvement in Grain Separators:

I claim the arrangement, as shown and described, of the double-toothed spur wheel, J, pinions, n, shafts, m, and fans, E E, with the feeding apron, D, bar, H, eccentric, I, and screws, F' G; all as set forth, for the purpose specified.

[This invention has for its object the combining of a more efficient screening device than usual with a stronger blast-generating mechanism, so as to obtain a more thorough separation of the grain from foreign substances, and have, at the same time, a simple, durable and economical machine.]

29,813.—David Pennoyer, of North East, N. Y., for an Improvement in Car Seats and Couches

I claim, first, The combination, with each other and with the seat, A, back, E, and slotted pronged bar, C, of the bars, a a, in the manner and for the purpose shown and described.

Second, The arrangement of the folding boards, G, rods, F, pivots, h, curved guides, j, vertical strips, H, adjustable platform, E, and cords, k k, as shown and described, so that, by pulling the cords, the boards, G, will fold inward, and the platform, E, will rise to the roof of the car, and, by releasing the cords, the platform will descend to its place; all as set forth.

[The object of this invention is to obtain an arrangement of seats and adjustable platforms whereby comfortable seats are provided for day-travel, and comfortable berths or couches for night-travel; the device admitting of accommodating as many persons with couches as it can provide with seats, so that all the passengers in a car that can be provided with seats can also be provided with berths or couches, with proper division boards.]

29,814.—J. G. Perry, of South Kingston, R. I., for an Improved Sausage-filler:

I claim the combination of the vanes and case, substantially as described and for the purposes set forth.

29,815.—R. S. Potter, of Chicago, Ill., for an Improvement in Car Couplings:

I claim, first, The arrangement for coupling cars from the side, by means of two links, k k, and the projections, F F, on the draw bar, in combination with the bolts, h h, and the pins, i i.

Second, The arrangement for connecting a wrought-iron hasp, B, to the cast-iron draw bar, A, by means of the hooks or projections, f, the shoulders, g, and the bolt, a.

Third, The arrangement for inserting the bolt or bar, b, and holding it in place, without nut or screw, by means of the bolt, a, substantially as set forth and specified.

29,816.—J. E. Briest, of St. Louis, Mo., for an Improvement in Printing Presses:

I claim the use of the stationary cylinder, P, when it is arranged and operated, with reference to the inking rollers, I I I, and distributing rollers, L, in the manner shown and described.

29,817.—Montgomery Queen, of Brooklyn, N. Y., for an Improvement in Journal-boxes:

I claim, first, The combination of the self-adjusting key, D, with the check-plate, C, as and for the purpose set forth and described.

Second, The employment of the lip, m, in combination with the end-piece, n, journal, F, and check-plate, C, as and for the purposes set forth and described.

29,818.—J. M. Read, of Boston, Mass., for an Improvement in Ovens:

I claim my improved oven, having the several parts constructed and arranged in relation to each other, and so as to operate in the manner substantially as described.

29,819.—Ezra Reid, of Bazetta, Ohio, for an Improved Fastening for Paddle Wheels:

I claim the arrangement of the stationary wheel, A, rods, C, with their pinions, B and D, the buckets, F, and wheels, E, in their relation to each other and to the tangential arms, H, operating in the manner and for the purpose specified.

29,820.—H. N. Rhodes, of Richmond, Vt., for an Improvement in Sliding Switches for Railroads:

I claim a solid sliding switch with rails, or equivalents for rails, for directing a train upon either of two side tracks, as desired, and with grooves, affording a safe passage on to the single track to a train coming upon one side track, when the switch is adjusted for the other; the whole constructed and operated as described.

29,821.—H. N. Rhodes, of Richmond, Vt., for an Improved Safety Railroad Switch:

I claim the use of a switch upon one side of a railroad track, constructed as described, and which, combined with rails, constructed and arranged as described, will insure a train taking the desired branch, and, at the same time, however it is adjusted, will furnish a safe passage to the single track for the train coming on either of the branch tracks.

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29,822.—L. P. Rice, of Adrian, Mich., for an Improvement in Slide Valves for Steam Engines:

I claim the employment of a box valve, A, that has its bottom elevated in the middle, as shown, when said box is arranged between two plates, A B; and the whole constructed so as to operate as represented and described, for the purpose set forth.

29,823.—A. Roden, of Talladega, Ga., for an Improvement in Plows:

I claim a sliding loop-brace, B C M, in combination with a wedge, V W, slotted swinging plate, L, moldboard-retaining hook, O P N, and standard, G; the whole coustructed substantially as and for the purposes set forth.

29,824.—H. A. Roe, of Madison, Ohio, for an Improvement in Cheese Hoops:

I claim the arrangement and combination, in the manner shown and described, of the plate, G, eccentric, H, and bolt, F, with the slotted arm, E, yoke, D, guides, c c, and plate, A, for the purpose set forth.

[This invention consists in the use of a cam and yoke appplied to the ends of the hoop, and used in connection with guides, whereby a simple, cheap, durable and inflexible joint is obtained; one that admits of the ends of the hoop, as they are opened and closed, moving in the arc of a circle, so as to preserve the circular form of the hoop, and one, also, that will readily admit of the hoop being enlarged and diminished, as may be required, to suit the size of the churn.]

29,825.—J. A. Roebling, of Trenton, N. J., for an Improvement in Trussed Compound Girders:

I claim a trussed compound girder, consisting of an iron girder filled-in with wood, combined with tension rods, having their strain directly sustained by the wood.

29,826.—E. S. Scripture, of New York City, for an Improvement in Wrenches:

I claim the serrated roller, I, hung eccentrically within the movable jaw, E, in combination with the spring catch, l, arranged and operated in the manner described and for the purpose set forth.

29,827.—J. C. Sellers, of Woodville, Miss., for an Improvement in Cotton Presses:

I claim the combination of one or two press boxes, A A′, and two followers, B B′, with two rack bars, M m N n, and center cog-wheel, O, when the followers are connected to said rack bars by means of cam levers, E G H I F J E′ G′ H′ I′ F′ J′, links, D C K L D′ C′ K′ L′, and inclined planes, R S R′ S′, as and for the purposes described.

29,828.—James Shaw, of Manayunk, Pa., for an Improvement in Gig Mills:

I claim the employment of a card cylinder or cylinders, arranged and operated as described, for the purpose set forth.

29,829.—A. L. Simpson, of Durham, N. H., for an Improvement in Working Ships' Sails:

I claim the combination and arrangement of devices applied to the yard, A, and the studding sail-boom, B, for the purpose of supporting such boom, and enabling it to run out and in under circumstances and in manner as described; such devices being the hanger, the foot rope, the runner, the ropes, K′ L, and the stop-hook and eye, as specified.

I also claim the arrangement of the screw, F, and the guide arm, G, with respect to the boom-hanger and rolling yard, A.

I also claim the arrangement of the top-gallant sheet-sheave, a, in or on the boom-hanger, as specified.

29,830.—H. E. Smith, of Philadelphia, Pa., for an Improved Washing Machine:

I claim the vibrating box, B, having its center of vibration situated below its center of gravity, as described, when the momentum of said box is arrested by its pins or projections, e and e′, striking against the springs, d and d′, or their equivalents, as and for the purpose set forth.

29,831.—T. B. Smith, of Marietta, Ohio, for an Improvement in Lamps:

I claim, first, The peculiarly-constructed burner described, consisting of the wick tube, T, and cup, C, constructed and united in the manner set forth.

Second, The shade, S, formed and operating as described.

29,832.—W. H. Tendler and J. F. Moeshlin, of Cambridge, Mass., for an Improved Sofa Bedstead:

We claim the described mode of arranging the mattress frames and applying them together and to the sofa frame, viz.: by means of a link or connecting bar, C, and a post, D, arranged at each end of the sofa and with respect to the parts, a b, the sofa and its seat, and connected therewith substantially as specified.

29,833.—Nehemiah Upham, of Norwich, Conn., for an Improved Steam Trap:

I claim the combination of a valve chamber, C, having valve seats, a, and that has one of its extremities, C′, fixed while the remainder of the chamber is allowed to expand and contract longitudinally with an adjustable valve stem, H, and valves, b, substantially as shown and described.

I also claim the arrangement, as shown and described, of the movable carriage or plate, E, chamber, C, valve stem, H, and bed-plate, G, for the purpose set forth.

[This invention is designed to facilitate the escape of the water which accumulates by condensation and remains in steam pipes that are used to warm buildings.]

29,834.—W. S. Wallace, of Americus, Ga., for an Improvement in Brick Machines:

I claim the arrangement of the pressing mechanism, consisting of the cams and eccentrics upon the central vertical shaft, H, with the lever slides and plungers, in relation to each other, the hoppers, screens and frame, and operating in the manner and for the purposes described.

29,835.—Able Ware, of Athens, Maine, for an Improved Surveyors' Instrument:

I claim the combination of a single graduated limb, vernier telescope or sights, with substantially the means described for changing the position of the aforesaid parts 90°, all operating together substantially in the manner described.

29,836.—Ephraim Wells, of Auburn, Miss., for an Improvement in Cultivators.

I claim so connecting and arranging the sole piece of a plow in regard to the frame, beam and handles, as that its lower side shall assume an oblique position when the sole is secured to the vertical standard of the plow, for the purpose of retaining the plow in a vertical position when it is passed over the inclined sides of ridges, substantially in the manner and for the purpose described.

29,837.—James White, of Bangor, Maine, for an Improved Amalgamator:

I claim the employment of a mercury-tight cylinder, provided with conical ends and lifting buckets, with hooks arranged longitudinally upon the inside of the cylinder, as shown and described, so that, while the quartz, dirt and water are allowed to pass through the machine, the mercury will be hindered, and will be lifted from the bottom to the top of the machine, and then discharged in showers upon and through the ore and other contents of the cylinder, and thus, by amalgamation, effecting the separation of the gold from the quartz, dirt and water, all as set forth.

[This invention consists in the employment of floats placed in a tangential or inclined direction into the inside of a rotary cylinder, for the purpose of taking up some of the quicksilver and dumping it into the liquid mass of the "tailings," so as to mix them thoroughly and to bring every particle of gold in contact with the quicksilver; and also in arranging said floats with hooks on both ends to prevent the quicksilver running off sideways.]

29,838.—J. T. Williams, of York Borough, Pa., for an Improvement in Lamps:

I claim the employment, in combination with a lamp that is supplied from an elevated reservoir of a transparent section, F, when said section is arranged between the lamp and the oil supply on a line horizontal to the proper oil level of the lamp, so as to facilitate the replenishing of the lamp without extinguishing the flame and without overflow, all as shown and described.

29,839.—D. Wolf and H. Wolf, of Lebanon, Pa., for an Improvement in Corn Planters:

We claim the arrangement of the conical cap, M, flanched perforated toothed plate, K, bar, N, adjustable plate, O, tube, R, notched share, S, shaft, Q, axle, D, and beam, A, all as shown and described, for the purpose set forth.

[This invention relates to an improved seed-distributing device, whereby the corn may be dropped or discharged from the hopper with regularity or in an uniform manner, and the device rendered capable of being adjusted to suit kernels of different sizes and forms.]

28,840.—D. T. Woodrow, of Cincinnati, Ohio, for an Improvement in Furnaces:

I claim, in combination with an outer casing, A, the fire-box, B, air tube, J, air chamber, K, and cylindrical chambers or radiators, F G, the latter containing the deflector, H; the whole being arranged in relation to each other and within the outer casing, A, as set forth.

28,841.—W. E. Wormell, of Germantown, Tenn., for an Improvement in Plows:

I claim the arrangement of the tri-lateral surface, a², inclined shares, C, moldboards, A, and standard, B, as and for the purpose shown and described.

[This invention relates to certain improvements in what are generally known as "shovel plows"—those used in the cultivation of southern crops, and designed for cultivators only—that is to say, for eradicating weeds and loosening the soil around or between growing plants without turning the soil and forming a furrow. The object of this invention is to effect a more thorough pulverization or working of the soil than hitherto with an implement of much less draught than all those of previous construction, and also to obtain a self-stamping implement and one of greater durability.]

29,842.—E. H. Angamar, of New Orleans, La., assignor to himself and Tobias Marcus, of New York City, for an Improvement in Cane-coverers:

I claim the combination and arrangement of the twin adjustable covering plows, P P, with the adjustable scraper, S, substantially as and for the purpose specified.

29,843.—Joseph Hardey (assignor to O. Chamberlain and W. H. Babcock), of Moline, Ill., for an Improvement in Pumps:

I claim the arrangement of the axle, B, plow, G, beam, H, guide bar, I, rack, J, sector, K, standard, M, caster wheel, F, arbor, E, and frame, A, all as shown and described, for the purpose set forth.

[This invention relates to that class of plows which are connected to a mounted frame containing a driver's seat, and are generally known as sulky or carriage plows. The invention has for its object the ready and facile adjustment of the plow, and also of the wheels whereby the device may be adapted to its work so as to plow or form a furrow of greater or less depth as occasion may require, and also adapted so as to be readily drawn from place to place.]

29,844.—Peter Louis, of New York City, assignor to himself and Hiram Wandel, of Castleton, N. Y., for an Improved Valve Gear for Steam Engines:

I claim the arrangement of the two connected adjustable tappet pieces, I I n n′, in connection with the valve yoke, C, and rocker, F G H, substantially as and for the purpose described.

And I also claim, in combination with the above-described arrangement of tappet pieces, the spring, j, applied in connection with the yoke and the rocker, substantially as and for the purpose specified.

[This invention consists principally in the combination] with a yoke connected with the valve or valves employed for the induction and cutting-off the steam, and with a rocker deriving motion from the main shaft of the engine and operating within and upon the said yoke to open the valve or valves at the proper time for the induction of steam, of two adjustable tappet pieces fitted to the yoke, for the purpose of being operated upon by an arm of the rocker to effect the closing of the valve or valves, and consequent cutting-off of the steam at such points in the stroke of the piston as may be desirable.]

29,845.—J. W. Truax (assignor to himself and O. J. Smith), of Richford, Vt., for an Improved Head Block for Sawmills:

I claim the toothed segment, K, and arm, L, provided with the wheels, H and G, bar, I, provided with the swinging or adjustable pendant, J, the wheels, H G, being attached permanently to the shaft, F, and the segment fitted loosely thereon, substantially as and for the purpose set forth.

[This invention consists in a novel arrangement of parts for gaging the lateral movement of the log, so that the latter may be readily adjusted previous to the commencement of each cut to saw boards or "stuff" of uniform thickness from the log.]

29,846.—Lewis Whitehead and S. P. Kettle (assignors to S. P. Kettle), of New York City, for an Improved Spring Mattress:

We claim, first, The combination of the brace, 2, constructed as described, with the spring, 1, substantially as and for the purpose set forth.

Second, The combination with the slats, 5 (upon which the springs are secured), of the beveled intermediate block, 6, and the hinges by which the said blocks and slats are connected, substantially as and for the purpose set forth.

Third, The combination of the head blocks or raising blocks, g g, with the slats to which they are attached, and with the intermediate blocks which connect the lower one of these slats to the next one below it, when the head pieces, g g, are so beveled as to underlie this intermediate block and thus relieve the hinge, as described and specified.

29,847.—Sylvenus Walker (assignor to himself and S. S. Hemenway), of Boston, Mass., for an Improved Trace-fastener:

I claim covering and protecting the projecting head, D, of the whiffletree on the outside of the tug, by shield piece, C, in the manner and for the purpose set forth.

29,848.—C. Williams (assignor to himself and J. F. Deffenbacker), of Weston, Mo., for an Improvement in Beehives:

I claim constructing the feed apparatus so that an uniform quantity of food will always flow into the trough, said trough having a perforated cover for the bees to feed through, in the manner and for the purposes set forth.

29,849.—G. W. N. Yost, of Yellow Springs, Ohio, assignor to himself and J. F. Watson, of Edwards Depot, Miss., for an Improvement in Cultivators:

I claim the arrangement and combination of the two beams, A, cross braces, K and L, movable shares, D, and wheels, G, the whole being constructed as and for the purposes described.

RE-ISSUE.

Clark's Patent Steam and Fire Regulator Co., of New York City, assignees of Timothy Clark, of Bedford, N. Y., for an Improvement in Safety Apparatuses for Steam Boilers. Patented August 21, 1847:

I claim the employment of a flexible vessel, substantially as described, when the inside of such vessel is combined and connected with a steam boiler to be expanded by the steam generated therein, and the outside with the mechanism which operates the damper, or its equivalent, for regulating the draught or blast of the furnace, substantially as and for the purpose specified.

EXTENSIONS.

T. W. Harvey, deceased, late of New York City (W. A. Harvey, administrator), for an Improvement in Machinery for Cutting Wood Screws. Patented August 18, 1846; re-issued Jan. 4, 1859:

I claim, first, The employment of a pair of spring pincers which receive the blanks one at a time and presents them to the jaws point foremost, substantially as described.

Second, In combination with the mandrel and jaws, or equivalent means for receiving and holding the screw blanks, the employment of a punch and driver for inserting the blank to the required distance, substantially as described.

Third, The combination of the pincers for transferring and presenting the blank to the jaws, or equivalent therefor, with the punch or driver, substantially as described, for driving the blanks out of the pincers and into the jaws, as set forth.

Fourth, The combination of the movable rest with the movable cutter head, substantially as described, and for the purpose of giving support to the blank while under the operation of the cutter, and to relieve the blank and get out of the way so soon as the cutting operation is completed; and this is claimed whether the cutting operation be performed on the head or any other part of the blank.

Fifth, The particular manner described of constructing the adjustable turning head, the slide or seat piece, C, the tool-holder D, sliding on the piece, C, between the check pieces, B′, with the respective adjustments thereof, combined, arranged and operating so as to effect the setting of the tool, substantially as set forth.

N.B.—The manner of operating the griping dies and of separating the blanks in the hopper and conveying them to the feeding fingers, being similar to those described and used in the machine for cutting the threads, are not claimed.

T. J. Sloan, formerly of New York City, now of Paris, France, for an Improvement in Wood Screws. Patented August 20, 1846; re-issued Feb. 22, 1848; again re-issued Nov. 23, 1858:

I claim, first, Making the core with a conical point, substantially as described, in combination with the body of a cylindrical form, or nearly so, substantially as and for the purpose specified.

Second, Making the core with a conical point, substantially as described, in combination with the thread formed on such conical point of a gradually less depth as it approaches the apex of the core, and with the several convolutions on the conical point and on the body at equal distances apart, substantially as and for the purpose specified.

Third, Making wood screws with the core of a conical shape along that part of the length of the screw extending from where the thread begins on the shank to where it becomes of full depth, substantially as and for the purpose specified.

Fourth, Making wood screws with the core of a cylindrical, or nearly cylindrical form, and with a conical point, in combination with the thread of equal pitch along the conical point and body, that is, with all the convolutions at equal distances apart and of gradually less depth from the base to the apex of the core, substantially as described.

Wm. Howe, deceased, late of Springfield, Mass. (Joseph Stone, administrator), for an Improvement in Truss Bridges. Patented August 28, 1846:

I claim, first, The manner in which I have combined the arch beam with the counter braces and the other parts of the truss frame, by means of the regulating screws that are made to bear on the arch beam or upon the bearing blocks or wedge pieces, c c, so as to effect the same purpose.

Second, I also claim the manner of sustaining the bearing of the braces on the string pieces by passing the metallic sockets, E E, entirely through the string pieces, so that the bearing blocks, c c, and the nuts, F, operate on the upper and lower ends of the sockets, and are not effected by the shrinkage of the wood-work.

Notes & Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

L. & K., of Ill.—The Patent Office has decided that where two parties apply for a patent jointly, and a caveat has been previously filed in the name of only one of the parties, the $20 paid into the Office at the time the caveat was filed cannot be applied towards the government fee, although the invention may be precisely the same as the one described in the cav at.

F. G. W., of La.—If you wish to gain a great deal of information in regard to the patent laws and practice of the Office in examining inventions and granting patents, and also concerning transfers and other information regarding the management and sale of patents, inclose two three-cent stamps, and order from this office a supplement of the SCIENTIFIC AMERICAN.

J. McG., of Ga.—Two of the specimens of minerals which you have sent us resemble lumps of iron slag; the third is principally composed of lime. It would cost considerable to make a quantitative analysis of them; but, if you desire this, we can recommend you to a competent chemist.

S. C., of N. Y.—There is no patentable novelty in your alleged improvement in mowing machines. The device you claim is already secured under McCormick's patent. We think you can secure a patent for your seed-sowing machine. The arrangement seems to be a good one, and we should think it might operate well.

H. G., of Miss.—If you will send on your Letters Patent, Judge MASON will examine into the validity of your claims, and suggest how to amend the patent so as, if possible, to cover all you desire.

G. H., of Va.—If your model is ready, please to send it on to us by express; and do not fail to inclose a careful description of the model. We will proceed to the examination at once, and write to you our views respecting your chance for a patent.

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C. A., of Pa.—In all cases of interference at the Patent Office, each party is called upon to furnish testimony as to the time when he first made his invention; and, before proceeding to take testimony, each party must serve a notice on the other of the time and place where the said testimony is to be taken. You had better, by all means, employ a competent attorney to attend to your case. It is important that it should be well prepared.

C. R., of N. Y.—We are not acquainted with any work on hydraulics that contains information, such as you want, for plumbers.

C. B. DAVIS, of Lawrenceburg, Tenn., wishes to purchase machines for making bobbins and quills. Who can furnish him? Write to him, as above.

O. H. P. P., of Pa.—We give an illustration of Stevenson's champion wheel in this week's issue of our journal. We are obliged to you for the information concerning the trials of wheels at Philadelphia. The substance of it will appear at an early date in our columns.

J. W. C., of N. Y.—The reason why we prefer a boiler with vertical tubes, is owing to the favorable results which have been obtained with such a boiler on board the United States frigate "San Jacinto," in comparison with one having the old-fashioned tubes. We do not mean one that has the fire returned through the tubes; but water tubes, as explained in Isherwood's "Engineering Precedents."

J. H., of Ind.—To make black varnish for iron-work, take 24 lbs. of asphaltum, fuse it in an iron vessel, and add 5 gallons of boiled linseed oil, 7 lbs. of litharge, and 1¼ lbs. of sulphate of zinc. The two latter must be added slowly, and the whole thoroughly stirred, or the oil will foam over. After boiling for two hours, add 4 lbs. of fused gum arabic, and boil two hours longer; then withdraw the fire, and cool down. Now add turpentine, and thin the varnish to a working consistency with it. This varnish is chiefly employed for the iron-work of carriages; it is beautiful and very durable.

O. C. S., of Ohio.—The plan of propelling vessels by means of a windmill on the ship to drive a propeller in the water has been frequently suggested. We have no idea that such a rig would be as good as the present one.

W. B., Jr., of N. Y.—The photographic process described on page 136, Vol. VII., SCIENTIFIC AMERICAN, is practical; but it has been superseded by improved processes. The time required for exposure to the light would depend on the light, and would be about three times as long as required for the daguerreotype.

B. F. H., of Mo.—The power developed by two 5-horse-power engines will, in no case, be more than 10-horse powers—no matter how the engines are geared-up or down. The weight which your two engines will "haul" depends upon the resistance of the driving-wheels in the ground. If the driving-wheels do not slip, your two engines are enabled to lift 330,000 lbs. in one minute to a hight of one foot. We do not know the power required to draw a 12-inch plow through the ground. The heating-tubes, where exposed to the flame on one, and to the steam on the other, side are liable to burn.

T. & W., of Va.—There is considerable difference of opinion about the proper velocity for running water wheels; but our largest manufacturers generally now consider about 6 feet per second of the periphery. This would give about 8½ revolutions per minute for a wheel 14 feet in diameter. The velocity of water under a head of 2 feet, is 11.344 feet per second—680.64 feet per minute—and the discharge from an opening with an area of 90 inches would be 425.4 cubic feet per minute—26,567 lbs. This, falling 14 feet, would produce 11¼ horse-powers. But, as an ordinary overshot wheel will not probably yield over 60 or 70 per cent of the power of the water, there would be 7 or 8 horse-powers yielded by your wheel and stream. We have no doubt that circular saws have been run with a smaller expenditure of power, in proportion to the work, than is required by the best upright saws.

G. H., of Miss.—Your article is received; it is able, but too long.

O. C., of N. Y.—We suppose that the muscular power of a man would be sufficient to move a balloon of sufficient size to support his weight, only a few inches out of its course, while it is going a mile with an ordinary wind; hence, the impracticability of guiding balloons.

W. C. I., of N. C.—A portable steam engine would be the best you could use for most of the operations on a plantation. We advise you to examine one of the "cow-milkers," and obtain an occular demonstration of its qualities for your own satisfaction.

H. W., of Pa.—The crude oil obtained from the natural springs of Pennsylvania requires to be purified for burning. It is, therefore, first distilled in a retort in the usual way; afterwards placed in a vessel, where it is agitated for three hours with about 5 per cent of sulphuric acid; then allowed to settle until all the sediment falls to the bottom. After this, it is again agitated with about 5 per cent of caustic soda, and distilled a second time when it is fit for burning, if the operations have been performed properly. We have seen very beautiful samples of oil taken direct from some wells. Dr. Antisell's work on the manufacture of coal oil—published by D. Appleton & Co., of this city—is a work you ought to have.

J. F. DANCE & BROS., of Columbia, Texas, employ stones weighing about 1,000 pounds in their grist mills, and run them at the rate of 400 revolutions per minute. They employ spindles of cast steel, the lower ends of which are about 1¼ inch in diameter, which they find almost impossble to keep from heating. Can any one of our readers communicate to them a remedy for this evil, without extending the area of the bearing surface?

T. H. M., of Md.—Blackberry cordial is made by boiling, for half an hour, one gallon of the juice of the berry with a like quantity of water, half a pound of cinnamon, two ounces of ginger and four pounds of sugar; then cool down, allow it to settle, decant off the clear, add one gallon of good spirits and bottle up. Blackberry wine is made by fermenting the diluted juice of the berry with one pound of white sugar to the pint of pure juice. Care must be exercised, so as to check the fermentation before it proceeds to the acetous stage.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Sept. 1, 1860:—

L. C. W., of Conn., $25; S. L. B., of S. C., $30; S. J. G., of N. Y., $25; F. P. P., of La., $15; J. C., of S. C., $35; J. K. G., of Pa., $25; S. H. & M. C. W., of Mass., $25; A. C. C., of R. I., $10; J. W.. of Ohio, $30; J. H. P., of Mo., $30; E. R. S., of Pa., $25; J. H. H. B., of N. Y., $32; L. & K., of Ill., $25; J. M. B.. of Maine, $55; C. A. R., of Ala., $55; J. M. S., of Pa., $10; W. H. O., of N. Y., $45; J. M. S., of Ill., $30; C. J. F., of N. J., $25; G. S., Jr., of Maine, $32; F. & C., of Iowa, $25; B. & B., of Ind., $25; J. V. H. S., of N. Y., $30; W. C. W., of Ill., $25; J. W. R., of Ga., $30; K. & T. C., of N. Y., $435; J. H. H., of N. C., $25; D. L., of Pa., $30; R. & W., of N. Y., $30; F. & J., of N. Y., $30; A. R., of N. Y., $60; T. A. M., of Mass., $25; J. A. B., of N. Y., $60; W. T. D., of N. Y., $25; I. P Jr., of N. Y., $25; W. F. K., of Ill., $14; J. D. H., of Ala., $25; R. W. H., of N. Y., $30; D. P., of Ill., $25; C. J. S., of N. Y., $55; R. S., of N. J., $30; A. B. C., of Ga., $35; J. H. & E. H. A., of Md., $30; S. W., of Vt., $185; G. H., of Mass., $25; P. H., of Mo., $30; O. S., of Mo., $30; C. G., of Ohio, $25; C. & E., of Ohio, $25; F. H. K., of Ky., $25; A. K., of N. Y., $30; J. P., of N. Y., $25; G. C. G., of N. Y., $25; D. A. B., of Ind., $10: D. H., of N. Y., $30; F. S., of Ill., $30; A. T. B., of N. Y., $30; C. R. O., of N. Y., $25; G. W. & J. J. K., of Pa., $15; J. H. G., of N. H., $30; C. C., of N. Y., $30; H. B. T., of Wis., $30; J. A., of Conn., $30; F. & S., of N. Y., $30; T. T. S., of Pa., $15; J. S. B., of N. Y., $30; J. H. B., of Mass., $30; M. W. W., of N. Y., $25; J. H., of Ind., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 1, 1860:—

T. A. M., of Wis.; W. T. D., of N. Y.; J. P., of N. Y., F. & C., of Iowa; J. W. H., of N. Y.; W. F.. of Mass.; T. T. S., of Pa.; P. C., of N. Y.; N. M., of Ill.; L. C. W., of Conn.; M. W. W., of N. Y.; J. A B., of N. Y.; A. B. C., of Ga.; G. H., of Mass.; E. R. S., of Pa.; C. G., of Ohio; I. P., Jr., of N. Y.; C. J. F., of N. J.; J. K. G., of Pa.; B. & B., of Ind.; F. & B., of N. Y.; I. P., of N. Y.; C. J. S., of N. Y.; F.H. K., of Ky.; G. C. G., of N. Y.; J. D. H., of N. J.; W McI., of Ill.; C. R. O., of N. Y.; W. H. O., of N. Y.; G. W. & J. J. K., of Pa.; L. & K., of Ill.; J. H. A., of Cal. (two cases).

USEFUL HINTS TO OUR READERS.

BOUND VOLUMES.—Persons desiring the first volume of the New Series of the SCIENTIFIC AMERICAN can be supplied at the office of publication, and by all the periodical dealers; price, $1.50; by mail, $2, which includes postage. The volume, in sheets, complete, can be furnished by mail; price $1. Vol. II. is now bound and ready for delivery. The price for this volume is the same as that charged for Vol. I

SUBSCRIBERS TO THE SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can have them supplied by addressing a note to the office of publication.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. CHARLES MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fifteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such casesas may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at their office.

They are very extensively engaged in the preparation and seeuring of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—It ake pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Communications and remittances should be addressed to

MUNN & CO.,
Publishers, No. 37 Park-row, New York.

STEINWAY & SONS' GOLD MEDAL PATENT Overstrung Grand and Square Pianos are now considered the best Pianos manufactured. These instruments have taken 16 First Premiums (gold and silver medals) within the last four years, in competition with Pianos of the best makers of New York, Boston, Philadelphia and Baltimore. Among the judges were Gottschalk, Wm. Mason, H. A. Wollenhaupt, and other musical celebrities. S. & Sons do not refer to artists who were in this country many years ago, or to certificates and testimonials given a long time since, as it is a well-known fact that such important improvements have been made in Pianos quite recently that many makers whose instruments were justly considered to rank among the best years ago cannot, by any means, claim the same position at the present time. We subjoin the following certificate, given within the last six months, by nearly all the leading and most prominent artists and musicians now residing in this country:—"The undersigned, having personally examined and practically tested the improvements in Grand Pianos invented by H. STEINWAY, in which the covered strings are overstrung above those remaining, do hereby certify:—1. That, as the result of the said improvement, the voice of the Piano is greatly improved in quality, quantity and power. 2. The sound, by Steinway's improvement, is much more even, less harsh, stronger and much better prolonged than that realized in any other Piano with which we are acquainted. 3. The undersigned regard the improvement of Mr. Steinway as most novel, ingenious and important. No Piano, of similar construction, has ever been known or used, so far as the undersigned know or believe. Gustav Satter, S. B. Mills, Wm. Sarr, U. C. Hill, Wm. A. King, Geo. F. Bristow, Wm. Mason, John N. Pattison, Robert Goldbeck, Geo. W. Morgan, Carl Bergmann, Henry C. Timm, and many others." Each instrument warranted for the term of five years. Warerooms—Nos. 82 and 84 Walker-street, near Broadway, New York. 1

THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 34 Park-row to—
No. 2 Bond-street, New York,
(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."

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Address CHAS. T. PORTER, 235 West Thirteenth-street, corner of Ninth-avenue, New York. A few reliable agents wanted.
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STOVER MACHINE COMPANY, NO. 13 PLATTstreet, New York—Manufacturers of Stover's Patent Eagle Molding Machine, for cutting and planing irregular forms of every description—illustrated in No. 25, Vol. I., SCIENTIFIC AMERICAN—and of the Stover & Coffin Patent Combination Planing Machine—illustrated in No. 19, Vol. II., SCIENTIFIC AMERICAN. Also, all kinds of Wood and Iron labor-saving machinery, Railroad Supplies, &c. &c.
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GRAY & WOODS' PATENT IMPROVED Planer; a combination of the Woodworth and Daniels' planers, particularly adapted for shop work, and for which we have obtained three patents and six medals. (See description and illustration in No. 6, Volume II., SCIENTIFIC AMERICAN.) Also, for sale, all kinds of wood-working machinery. Send for a circular. Address GRAY & WOODS, No. 69 Sudbury-street, Boston, Mass. 1 tf

FAN-BLOWERS — OF VARIOUS SIZES AND kinds, for smiths' fires and foundries, for sale by SAMUEL B. LEACH, No. 23 Platt-street, New York. 1 11*

A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence.
MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

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WING'S CRIMPING MACHINE.

After all the complicated contrivances that have been introduced into the construction of machines for crimping leather, it is a relief to see the operation as perfectly performed by so neat, cheap and simple a machine as is illustrated in the accompanying cut.

The leather, A, Fig. 1, to be crimped is folded around the lower edge of the crimping bar, C, to which it is secured by the clamp represented in Fig. 2. A cast iron block, C, fitted to straddle the upper edge of the clamping bar, has its outer edges serrated, and the screw, *d*, passing through its middle. Straddling the block, C, is the block, B, through which passes loosely the smooth part of the screw, *d*. It will be seen that as the screw, *d*, is turned, the block, C, is drawn upward towards the block, B, griping the edges of the leather between the serrated parts of the two blocks; and if the turning of the screw is continued, both blocks are drawn upward, stretching the leather around the lower edge and along the sides of the crimping bar. The crimping bar is pivoted at one end, *e*, and after the leather is secured, it is forced down between the jaws, F, by means of the pinion, *g*, acting upon the rack, *h*. The jaws, F, are secured to the frame of the machine by loose bolts, and their distance apart is controlled by a screw which has the crank, *i*, upon its end, for turning it. This arrangement is for the purpose of adjusting the space between the jaws to leather of various thicknesses.

Besides the remarkable simplicity of this machine, it is manifest that it is convenient for its purpose, easily operated, durable, and can be afforded at a very small price. The patentee is manufacturing the machine and offers them for sale.

The patent for this invention was granted July 31, 1860, and further information in relation to it may be obtained by addressing the patentee, Horace Wing, at Buffalo, N. Y.

HOW TO KEEP SWEET POTATOES.

A correspondent of the Oskaloosa (Iowa) *Herald* gives the following method of keeping the sweet potato through the winter:—"I use dry sand and put them in; it does not matter how the sand is dried—in a kiln, in a log heap, or in the sun, so that it *is* dry, that is all that is required. I prefer drying in a log heap, as it costs four times less and is just as good. Any family that has a little room with a stove in it, may keep a box or two of eight or ten bushels without much inconvenience. The boxes must be raised six or eight inches from the floor, and they must not be nearer than four inches from the wall. Fill the box with potatoes, and then put in sand; cover the potatoes with sand. There is a good deal said about kiln-dried sand, but it is all fudge. I have also known them to be kept well in buckwheat chaff. In order to keep potatoes with success, there must be a thermometer kept in the room. The mercury must not sink below 40°; if it does, the potatoes will chill and rot; it also must not rise above 60°, or they will grow. I never lost any of my potatoes except by letting the room get too cold. A thermometer only costs a dollar, and every man ought to have one."

NEW PROCESS OF GILDING AND SILVER-PLATING.

We learn from *Le Génie Industriel* that a new process of silver-plating and gilding has recently been patented in France by MM. Peyraud and Martin, which has some decided advantages over any processes heretofore in use, as the substances are applied cold with a pencil, and can thus be placed on any part of the object to be plated.

For gilding, 10 grammes of laminated gold are mixed with 20 grammes of hydrochloric acid and 10 grammes of nitric acid. The liquid thus composed is placed over a moderate fire and stirred constantly until the gold passes into the state of the chloride. It is allowed to cool, and then dissolved in 20 grammes of distilled water. A second liquid is formed by dissolving 60 grammes of the cyanide of potassium in 80 grammes of distilled water. The two liquids are mixed together in a decanter, stirred for twenty minutes, and then filtered. Finally, 100 grammes of whiting, dry and sifted, are mixed with 5 grammes of pulverized cream-of-tartar. This new powder is dissolved in a portion of the above-described liquid, in sufficient quantity to form a paste of the proper consistency to be spread with a pencil on the object or part to be gilded. The superabundant powder is then removed from the object by washing it and cleaning it with a brush.

Fig. 1

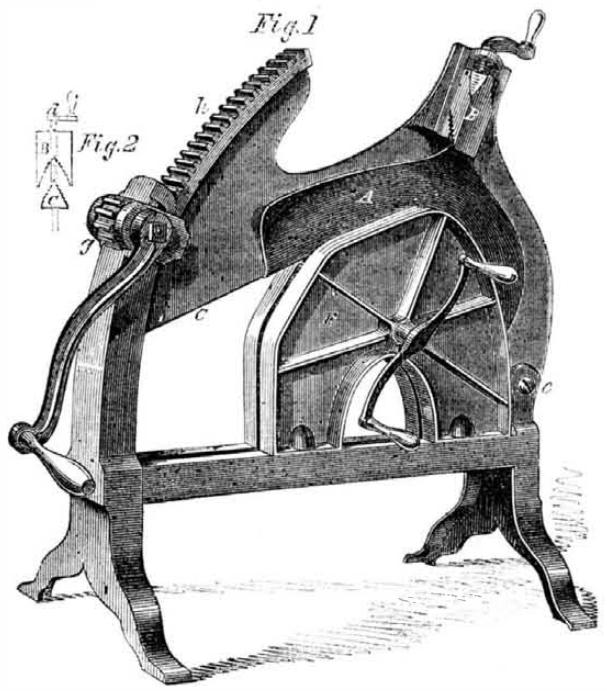

Fig. 2

WING'S CRIMPING MACHINE.

For silver-plating, 10 grammes of nitrate of silver are dissolved in 50 grammes of distilled water; then 25 grammes of cyanide of potassium in 50 grammes of distilled water. The two liquids are mixed in a decanter and stirred during ten minutes, then filtered. Finally, 100 grammes of sifted whiting are mixed with 10 grammes of pulverized cream-of-tartar and 1 gramme of mercury. This powder and the dissolving liquid are used in the same manner as directed for the gilding operation.

KEARNEY'S IMPROVED SCREW JACK.

Fig. 1

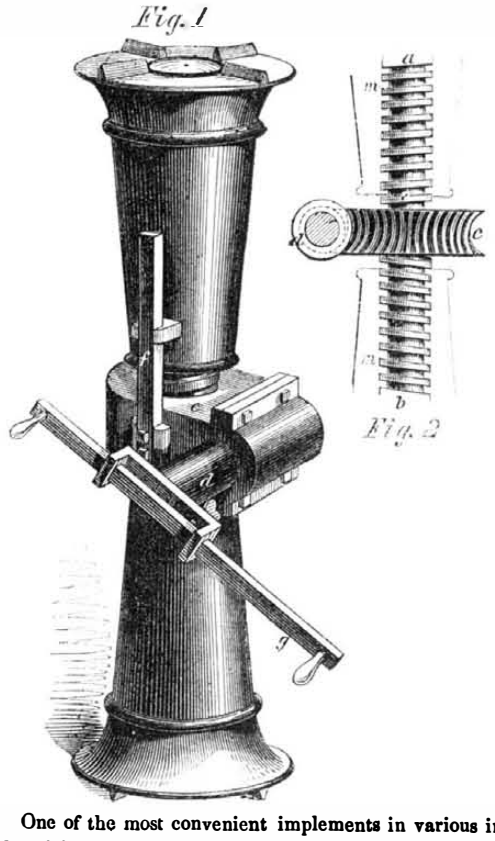

Fig. 2

One of the most convenient implements in various industrial operations is the lifting jack, and it is surprising that it is not in more general use. There is hardly a large farm in the country on which one of these convenient little implements would not pay for itself every year. At present its employment is mostly confined to heavy operations, like the raising of buildings, upon railroads, &c., though it is the practice, in some parts of the country, among the drivers of large teams, to carry a jack on the road for use in greasing the axles of a loaded wagon, or in lifting a wheel out of the mire in case of need. The convenience of the implement is, however, forcing itself upon the attention of the community more generally, and the larger demand is stimulating inventors to make improvements in the article. The one here illustrated was invented by William Kearney, of Newark, N. J., and its advantages will be readily understood from the following description:—

A stout screw, with the thread upon its two ends, *a* and *b*, running in opposite directions, fits into the two cast iron nuts or cases, *m m*, so that when the screw is turned in the cases they are forced asunder. For turning the screw, a gear-wheel, *e*, is fastened rigidly around its middle portion, and a worm, *d*, is made to mesh into the wheel, *c*, this worm having its bearings in the box, *e*. To prevent the box, *e*, from turning round instead of the wheel, the bar, *f*, is placed between the studs on the case and on the box as clearly shown in Fig. 1. The worm, *d*, is turned by means of the crank, *g*, which is constructed of a sliding bar and handles, the bar being secured in any position desired by means of a set-screw. This arrangement of the lever, it will be perceived, allows the working of the jack in a very narrow space, permitting its employment in places where it would be impossible to use a jack with a horizontal lever. By the employment of the worm in connection with the gear wheel, great multiplication of power is obtained, as it requires eleven turns of the worm to effect one revolution of the gear wheel, and consequently of the main screw; and as there are four threads to the inch on each end of the main screw, one of its revolutions raises the load half an inch.

The inventor states that, in an experiment with this jack made on the Morris and Essex railroad, the fire-box end of the engine "Delaware," which weighs 30 tuns, was raised by one of these jacks weighing only 60 pounds.

The patent for this invention was granted Oct. 19, 1855, but has only recently been introduced to the public. Additional information in relation to it may be obtained by addressing D. G. Pettengill, agent and manufacturer, at Belleville, N. J. The jacks are also for sale at the store of S. A. Heath & Co., 102 William-street, this city.

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